A McGraw-Hill Publication

Journal of Electricity and Western Industry

25 Cents a Copy

January 1, 1923

San Francisco

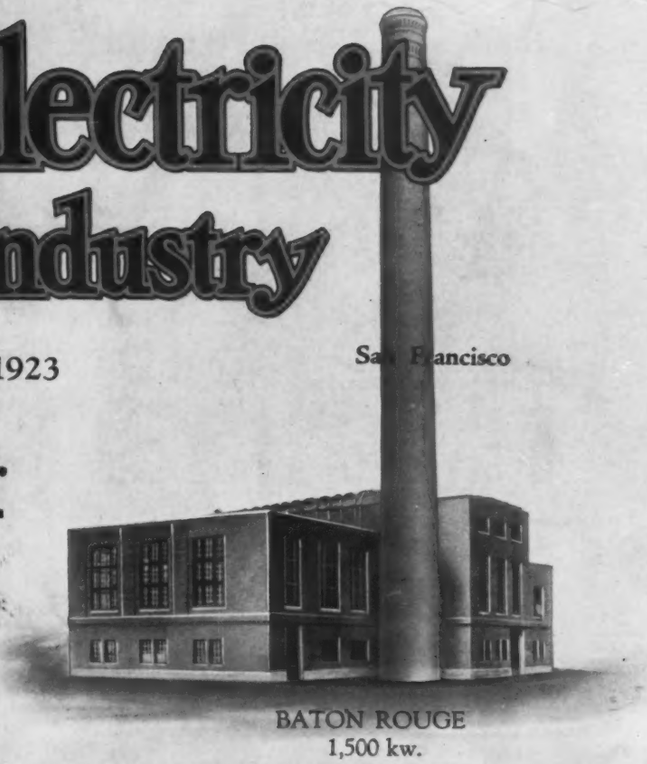
1¼ Million Horse Power

is the capacity of steam power stations designed and built by Stone & Webster. This includes 1¼ million horse power in stations now under construction.

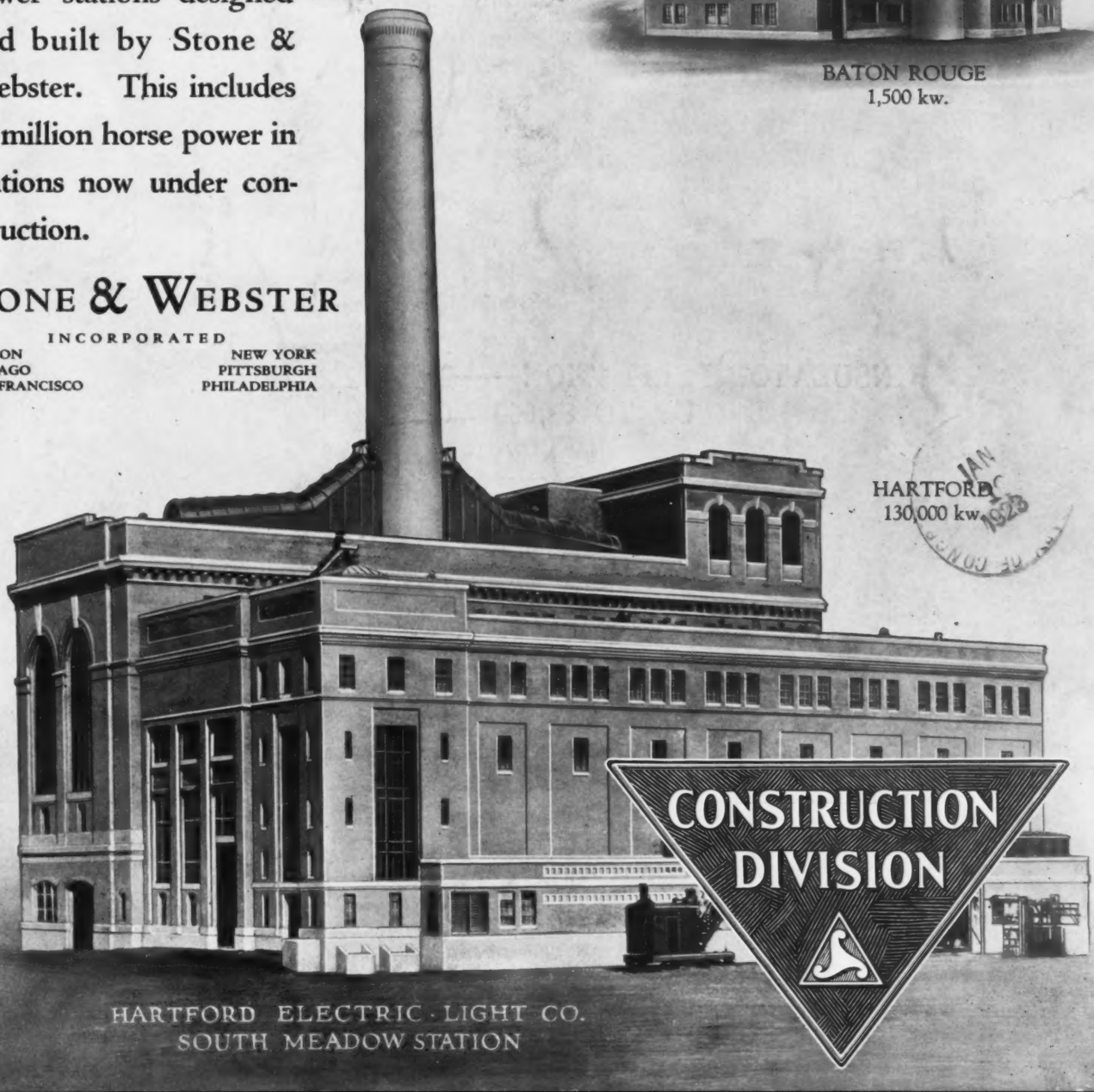
STONE & WEBSTER

INCORPORATED

BOSTON
CHICAGO
SAN FRANCISCO
NEW YORK
PITTSBURGH
PHILADELPHIA



BATON ROUGE
1,500 kw.



HARTFORD
130,000 kw.

CONSTRUCTION DIVISION

HARTFORD ELECTRIC LIGHT CO.
SOUTH MEADOW STATION

P I N C O

An
Integral Part

—of
"The Perfect Line"

INSULATOR PERFECTION——LINE PROTECTION
UP TO 88,000 VOLTS

MANUFACTURED BY
PORCELAIN INSULATOR CORPORATION
LIMA, N. Y., U. S. A.

Three Pacific Coast Stocks Carried by

Baker-Joslyn Company

RELY ON LOS ANGELES SEATTLE SAN FRANCISCO SERVICE

183-199 First St.
SAN FRANCISCO

330-332 Azusa St.
LOS ANGELES

2424-28 First Ave. So.
SEATTLE

Distributers
Hot Galvanized Pole Line Hardware
Wood Poles, Cross Arms and Pins
Construction and Linemen's Tools
Porcelain and Glass Insulators
Porcelain Knobs, Tubes and Cleats
Insulated and Bare Copper and Iron Wires
Rigid Iron Conduit and Fittings
Flexible Metallic and Non-metallic Conduit and Armored Conductors
Switches, Switchboards and Fuses
Insulating Materials

Journal of Electricity and Western Industry entered as second class matter February 17, 1921, at the post office at San Francisco, under the Act of Congress, March 3, 1879.
Published the 1st and 15th of each month, at Rialto Building, San Francisco, California.

©CIB567594 JAN 10 1923

Journal of Electricity and Western Industry

A McGraw-Hill Publication

Established 1887

C. T. HUTCHINSON, Acting Editor

NORMAN S. GALLISON, GEORGE C. TENNEY, Associate Editors

ROBERT SIBLEY, Consulting Editor
CLOTILDE GRUNSKY, Contributing Editor

VOLUME 50 | SAN FRANCISCO, JANUARY 1, 1923 | NUMBER 1

Contents

EDITORIALS 1

Happy New Year—Robert Sibley Becomes Executive Manager of California Alumni Association—The Journal of Electricity and Western Industry and Its Function in the Electrical Industry — A Merited Recognition of a Western Scientist and Engineer—Electrical Ordinances Have Not Kept Pace with the Use of Electricity—Engineering Qualifications for Regulating Bodies—More Adventures in Goodwill Are Needed in the Public Utility Field.

INSURING THE GROWTH OF PORTLAND — by W. C. Heston 9

Electric Public Utilities Must Look Far Ahead in Their Construction Plans to Meet the Demands Which the Future Will Bring Upon Them. Anticipating the Growth of Its Territory in Portland and Vicinity, the Portland Railway, Light & Power Company Is Spending Ten Million Dollars to Insure Ample Power, in Order That This Growth May Not Be Retarded.

DEPARTMENT STORE METHODS FOR MERCHANDISING WASHING MACHINES 13

A Description of the Methods Used by "Washer" Wilson in Building Up a Trade in Which He Has Sold One Thousand Carloads of Washing Machines in the Last Thirteen Years.

ELECTRIC REDUCTION FURNACE IRON FOR A STEEL MAKING BASE — by R. C. Gosrow 16

A Comparison of the Costs of Producing Iron Direct from Iron Ore by Electric Furnaces with the Cost of Producing Steel Pig by Other Processes in the Western States.

Current Comment 4
Discussion 6
Successful Gasoline Electric Car Is Designed for Swiss Railroad 17
Electricity in Industry 18
Jobber, Dealer and Sales Agent 20
Industrial News 26
Meetings 31
Personals 32
Manufacturer, Dealer and Jobber Activities 34
Trade Outlook 35
Construction News 36

PUBLISHED SEMI-MONTHLY BY

McGRAW-HILL COMPANY OF CALIFORNIA — Rialto Building — SAN FRANCISCO

James H. McGraw, *President*
C. T. Hutchinson, *Vice-pres. & Gen. Mgr.*
C. M. Lindsay, *Vice-pres. & Treas.*

WASHINGTON, Colorado Building
CHICAGO, Old Colony Building
PHILADELPHIA, Real Estate Trust Building
CLEVELAND, Leader-News Building
ST. LOUIS, Star Building
NEW YORK, 10th Ave. and 36th St.

McGRAW-HILL CO., Inc., New York
Publishers of

American Machinist—European Edition (*Published in London*)
Industrial Engineer (*Published in Chicago*)
Chemical and Metallurgical Engineering
American Machinist — Ingenieria Internacional
Electrical World — Electric Railway Journal
Engineering and Mining Journal-Press
Bus Transportation — Engineering News Record
Coal Age — Electrical Merchandising — Power

Copyright, 1922, by McGraw-Hill Company of California. Entered as second-class matter Feb. 17, 1921, at the Post Office at San Francisco, California, under Act of March 3, 1879.

Member Audit Bureau of Circulation.
Printed in U. S. A.

Subscription rates in United States, Canada, Mexico, Cuba, Porto Rico, U. S. Possessions, Argentina, Bolivia, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Nicaragua, Panama, Honduras, Salvador, Uruguay, and Spain, $2.50 per year, 2 years $4.00. Elsewhere $4.00 Gold (17 Shillings). Single copy, 25c. When change of address is required, both old and new addresses must be given. Notice must be received two weeks before change takes place.

Please enter my subscription to the "Journal" for 1 ( ), 2 ( ) years, for which please send bill.
(Please print name and address plainly below)

SPAR-TAP

2-Way Socket

Holds the lamp vertical.

Holds the shade properly.

Pull chain controls light.

Side outlet fits any Standard parallel-blade attachment plug.

Both outlets 660 watts, 250 volts.

Easy to Sell

Packed in four-color display carton—ten in a carton.

Open the carton and set it on the counter. When ten are sold, open another carton. No assortments, no dead stock. This is clean, live merchandise.

AV-33 Spar-tap Sockets

List price, $1.00

Schedule B2—Standard Package 50—Carton 10.

Order from your distributor.

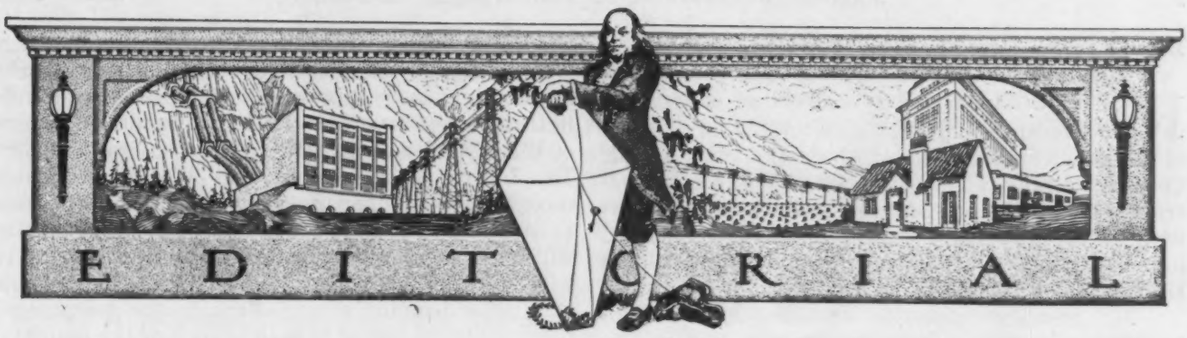
THE BRYANT ELECTRIC COMPANY

BRIDGEPORT, CONNECTICUT

NEW YORK
342 Madison Ave.

CHICAGO
844 West Adams St.

SAN FRANCISCO
149 New Montgomery St.



Happy New Year

JANUARY FIRST, in an industrial sense, means annual reports, trial balances, inventories, and, to the fortunate, a dividend. In an astronomical sense, it means that the earth has successfully negotiated another trip around the sun in its course through aphelion and periphelion, that another step in the precession of the equinoxes has been chalked up on the score board of the ages. In a social sense, in a spiritual sense, the thought of "On Earth Peace, Good Will Toward Men," takes possession of the son of man, and the cheery "Happy New Year" echoes around the civilized world.

SINCE the past is the basis upon which the curve may be projected into the future, let us view the remains of the late 1922, marked, insofar as it deals with the electrical industry of the West, by one major crisis passed, and by a quickening of the pulses of every field of electrical endeavor. This, in itself, constitutes the best possible augury for the future.

THE overwhelming defeat of the Water and Power Act at the polls does not mean that this issue has been disposed of once and for all time. On the contrary, 1923 will see a continuation of the fight. There must be no cessation in the work of enlightening the people as to the direct bearing upon them, their lives, comfort and happiness, present and future, of the continued progressive development of hydroelectric power by private ownership under State supervision and regulation.

THE Electrical Home is a development peculiarly western, in fact, this is one of many instances where the West has blazed the trail of progress for the rest of the world to follow. Blessed with an ample power supply, available at rates lower than those obtaining in any other section of the United States, there is nothing in the way of practically universal application of this idea but human limitations.

THE extension of the community spirit, the cooperative idea, the banding together of kindred interests for self help and for the achievement of higher ideals in their relations to those they serve, is a reassuring indication of the firm foundation upon which is being erected the electrical industry of the future. The many cooperative campaigns now under way in the western states, and the increasing support accorded them by individual electrical interests is the best proof that the idea is sound, constructive, and for the best interests of everybody.

LET us view 1922 in the light of achievement, a real start in the consummation of the highest ideals of the electrical industry, the betterment of the condition of mankind through the increased application of electrical energy. Let us look forward to whatever 1923 has in store for us, confident in the righteousness of our cause, secure in the knowledge that we are building for the future of the West in such a way that coming generations may rejoice in their heritage.

Robert Sibley Becomes Executive Manager of California Alumni Association

ROBERT SIBLEY, for several years editor, and more recently editorial director of the Journal of Electricity and Western Industry, and Pacific Coast editorial director of Electrical World and Electrical Merchandising, has resigned these positions with the McGraw-Hill Company to become associated in an executive capacity with the alumni work of the University of California.

Mr. Sibley's connection with the McGraw-Hill Company's electrical journals, however, will not be completely severed as he will retain his connection with the Journal of Electricity and Western Industry as consulting editor, and will also act as Pacific Coast consultant to both Electrical World and Electrical Merchandising.

Mr. Sibley's connection with and contributions to the electrical industry in the West are too well known to require extended discussion. Taking up, as he did, the Journal of Electricity and Western Industry editorial work while he was still professor of mechanical engineering in the University of California, he developed the Journal into a western publication rendering noteworthy service in its field.

As executive manager of the Alumni Association, Mr. Sibley brings to this phase of University work not merely a thorough groundwork of experience in University affairs but the ripened knowledge gained through years of contact with western industry in all its phases plus that indefinable something called personality, so essential to one who is engaged in public service.

With these qualifications, it is natural that he should have been unanimously selected by his Alma Mater to assume the leadership in the work of welding together a great body of alumni for the purpose of bringing home to the people of the West a true concept of the University of California, its purposes, ideals, and its direct bearing upon the destinies of the West.

Mr. Sibley is taking with him into his new work the best wishes of his associates in the McGraw-Hill Company, who anticipate that despite the changed relation, they will continue to have the benefit of his ideas, experience and sympathetic cooperation in the consulting capacity which he is now to occupy.

The Journal of Electricity and Western Industry and its Function in the Electrical Industry

BEGINNING with this issue, the editorial staff of the Journal of Electricity and Western Industry will comprise C. T. Hutchinson, acting editor, Norman S. Gallison, George C. Tenney, associate editors, Clotilde Grunsky, contributing editor, and John W. Otterson, assistant editor. With Robert Sibley as consulting editor, and the usual force of correspondents, it is the purpose of the publishers to exert every power at their command to give the electrical industry a medium of expression that will be essentially of the West, by the West and for the West.

Since the development and generation of electrical power by the central station has taken such an important place among industries of the West, and with every phase of western life from the home to the industrial plant dependent upon energy so produced, there is an opportunity and a need for a publication here whose purpose is the welding together of the diversified interests of the electrical industry. The Journal of Electricity and Western Industry recognizes this opportunity for service and this need as an obligation; that which is best for the industry will also be best for this publication. Every issue will be dedicated to constructive service in this field and while bending every effort to the purpose of being a helpful factor in each branch of the industry, the publishers look forward confidently toward the consummation of higher and higher ideals of service to the electrical West.

Engineering Qualifications for Regulating Bodies

EXCEPTION has been taken, in a communication elsewhere in this issue, to the editorial appearing in the Dec. 1 issue of the Journal of Electricity and Western Industry entitled "Engineering Qualifications Not the Only Ones for Utility Commissioners." The engineering profession—and rightly—has taken the stand that engineering thought is needed in the councils of those who determine the policies and principles governing public utility activity.

This stand has been so consistently maintained by the Journal of Electricity and Western Industry that it was not thought necessary to reaffirm this position. An engineering training would be of benefit to every member of such regulating bodies. There is no justification for the stand too often taken by appointing bodies that an engineer is disqualified because of his special knowledge. As well insist that all judges should be ignorant of the principles of the law.

It is of little avail, however, for the engineering profession to stand about urging the appointment of "an" engineer. There are, as the editorial under criticism pointed out, other qualifications necessary besides a grounding in engineering principles. The reason that so few engineers have been appointed to various commissions in the past has undoubtedly been due to the fact that among the men possessing these other qualifications—men sufficiently prominent to merit their appointment to a position of such responsibility,—there have been four equally available lawyers, editors or business men to every one engineer. Not being sufficiently familiar with the engineering profession to know whom to choose and finally narrowing the choice down to an engineer of no particular standing, proposed merely because he was an engineer, against a non-professional man of outstanding reputation, the appointing body has, and often we think rightly, appointed the business man.

We believe in the ability of the engineer to serve the community—but we do not believe in the tendency toward the development of a class consciousness among engineers which would permit of the urging of the appointment of engineers to positions of importance merely because they are engineers. With this caution to the engineering profession to

consider the other qualifications for the positions in their choice of candidates, the Journal of Electricity and Western Industry hopes to see one or more engineers of admitted professional eminence appointed to fill the vacancies now occurring on western utility commissions.

A Merited Recognition of a Western Scientist and Engineer

THE award of the Edison medal for 1922 to Dr. Robert A. Millikan, Director of the Norman Bridge Laboratory of Physics at the California Institute of Technology, is an act which cannot but meet with the hearty approval of everyone in the electrical industry. The medal is awarded annually by a committee consisting of twenty-four members of the American Institute of Electrical Engineers for "meritorious achievement in electrical science, electrical engineering or electrical arts," and is one of the highest honors which an electrical engineer or scientist can achieve.

Probably the best known and most noteworthy of Dr. Millikan's works are his so-called "oil-drop" experiments, undertaken for the purpose of making precise measurements of the fundamental electrical quantity. These experiments proved conclusively that all electrons are alike and the results obtained have been of inestimable value in the calculations of physical constants.

Second only to the oil-drop experiments is his work on photo-electric effect and his measurement of the "h" constant, which has to do with growth and decay of photo-electric phenomena. This work is recognized as the best experimental check on some of the Einstein hypotheses. His more recent work has tended toward a definite bridging of the gap between light and X-ray phenomena.

Although Dr. Millikan's claim to recognition rests particularly on his experimental researches, his work during the war and in the formation of the National Research Council, on which he served as executive head, are particularly noteworthy. To Dr. Millikan probably above all others is due the credit for whatever good resulted from the activities of America's scientists; he contributed not only from his own great store of knowledge but was largely the driving force which directed the activity of others, including the Government Bureaus, and stimulated individuals to an almost superhuman activity.

Electrical Ordinances Have Not Kept Pace with the Use of Electricity

A TENDENCY toward the greater use of electrical appliances in the home is growing by leaps and bounds. This is not the result of fad or fancy but is an evolutionary movement caused by a change in the mode of living of the American family. The scarcity of domestic servants is but one of the many things which are popularizing the small home and apartment. The complexity of our modern social life makes so many demands on the time of the housewife that she is forced of necessity to call upon electricity for help.

Not so many years ago what have now become essentials in the way of sanitary plumbing were looked upon as luxuries and fads. Electrical appliances are no longer toys and luxuries. Once intelligently installed and used they are seldom discarded. The wiring is as much a permanent part of the house as the plumbing, and the householder is entitled to equal protection in its installation. The average plumber is thoroughly grounded in the subject of sanitation and ventilation. Ordinances specifying that none but a licensed plumber can install plumbing are in force in every town. On the other hand, use of electricity in the home has increased so rapidly that ordinances governing wiring installations are in many cities sadly out of date. Many towns do not license electricians. The result is the overloading of circuits, unsatisfactory and even dangerous installations by high school boys and the like.

The standardization of the wiring equipment of the modern home through cooperation with city inspection departments whereby model ordinances covering installations and licensing may be prepared, is a field which should not be overlooked by the associated electrical interests.

More Adventures in Goodwill Are Needed in the Public Utility Field

A YEAR ago the privately-owned public service companies of Colorado, New Mexico, and Wyoming embarked upon an unique adventure. They set out to reach the goal of public goodwill—to attain a larger measure of the friendship and confidence of their customers.

The unbeaten trail, in places, lay through a wilderness of indifference on the part of those whose goodwill was sought. But self interest was invoked to dispel this lethargy. Frankness and fairness were employed as guides to blaze the way. Newspaper advertising, chiefly, provided the light of understanding.

The Rocky Mountain Committee on Public Utility Information was the instrument through which these goodwill activities were systematically prosecuted. Universities, high and grade schools, libraries and state officials and institutions now turn to it for information. The people in general have been rendered a distinct service. They have a better understanding of how their interests are advanced by fair treatment of their utilities.

This adventure on the part of the utilities of the Intermountain region has no doubt been watched with interest by public utility executives throughout the West. Intelligent men in the public utilities are now generally convinced that in the final analysis it is to their best interest to take the public into their confidence. The demonstrated success of the Rocky Mountain Committee on Public Utility Information has removed this question from the experimental field. It will not be surprising to see similar bodies established in other sections. Let frankness and fairness prevail, let courtesy and square-dealing be the watch-words and the public will be quick to respond.

CURRENT COMMENT

California electrical utilities having annual operating revenues of more than $250,000 need keep but one set of books of accounts as the result of an order of the State Railroad Commission establishing a new system of accounting for these corporations. The new system substantially conforms with that of the Federal Power Commission and embodies sound accounting principles and practices. Under it the companies are relieved from keeping two sets of accounts.

Rules Governing Utility Accounts Are Changed

The greatest departure from the system of accounting which is now in effect is the classification of property on a functional basis, or on the basis of what it is used for instead of the material it contains. For example, transmission and distribution systems would now be listed as separate accounts instead of jointly, with sub-classifications for wire, poles, insulators and the like. Similarly, there will be separate accounts for hydro and steam plants under the new system instead of one general account for power plants. Thus, not only are the accounts more easily analyzed but they are more comprehensive and clear.

An exception to the new ruling of the commission is made in the case of electrical corporations which operate only steam generating plants, transmission and distribution systems, or which operate only transmission and distribution systems and also operate gas plants. They may keep their accounts and records during 1923 in accordance with the system now in effect.

Estimated sales of tungsten filament lamps, excluding the miniature type, in the United States during 1922 totaled 205,000,000, which is 3,000,000 more than in 1920, the record year, and 45,000,000 more than in 1921. Sales of carbon filament lamps are estimated to have been 4,000,000, as compared with 63,000,000 in 1907, the year in which they reached their maximum sales and in which the tungsten type first began to be marketed.

Progress Made in Lighting During 1922

The progress which has been made in the field of lighting during the past year has been summed up by John Liston of the General Electric Company. He points out that the most spectacular development was the production of a 30,000-watt unit, having a capacity of 100,000 mean spherical candlepower for use in experimental motion picture work. This is the largest lamp ever manufactured.

Considerable work has been done toward perfecting a method of coloring bulbs and a weatherproof and fade-proof type has been achieved through the use of a color spray. Highway lighting has been developed to a point where it is now practical and many important applications have been made, especially at grade crossings. Store lighting and school room lighting have both received attention and study. Floor and table lamps are becoming increasingly popular in homes and a new type of semi-indirect portable which bids fair to further popularize the portable luminaire and better the lighting of the home has been developed. Industrial lighting needs have been studied and several improvements made, especially in reflectors.

The sale of approximately 83,000,000 miniature lamps demonstrates the increasing importance of this field of lighting. More than 58,000,000 of these were used in automobiles, while 8,000,000 were incorporated in Christmas tree lighting sets. The remainder were used in flashlights and for miscellaneous purposes.

The field of lighting is becoming highly specialized and as more studies are made of its various phases greater development is to be expected. Based on the results of the past year, 1923 is full of promise in this line.

The relative importance of the various Pacific Coast ports as centers of foreign trade is shown in a survey which has recently been completed by the bureau of research of the United States Shipping Board. The figures show that while Portland is pushing San Francisco for first place in cargoes cleared, the Golden Gate city continues to receive almost half of the cargoes entered. The following table shows the standing of the ports both in cargoes cleared and cargoes entered:

Pacific Coast Ports Handle Large Tonnage

PORT	Cargoes Cleared	Per cent of District total	Cargoes entered	Per cent of District total
San Francisco, Calif.	1,522,605	28.0	767,787	48.4
Portland, Ore.	1,318,761	24.3	31,233	2.0
Seattle, Wash.	831,168	15.3	198,268	12.5
Los Angeles, Calif.	786,713	14.5	442,229	27.8
Tacoma, Wash.	228,179	4.2	105,035	6.6
San Luis, Calif.	199,953	3.7	.....	.....
Astoria, Ore.	130,581	2.4	18,377	1.3
Aberdeen, Wash.	110,911	2.0	.....	.....
Everett, Wash.	75,928	1.4	1,842	1.4
San Diego, Calif.	71,060	1.4	13,488	1.4
Bellingham, Wash.	63,994	1.2	1,121	1.4
Port Angeles, Wash.	44,935	.8	1,833	1.4
Port Townsend, Wash.	27,668	.5	3,353	1.4

Lumber, wheat and petroleum are the chief products exported, with the former far in the lead.

There is opportunity for thought in the following figures which show that less than 37 per cent of the cargoes were carried in American vessels.

Exports (in long tons)

Commodities	American	Foreign	Total
Lumber	488,104	1,107,352	1,595,456
Wheat	154,985	943,195	1,098,180
Petroleum	653,138	337,461	990,599
Barley	84,607	269,358	353,965
Other grains	29,430	76,235	105,665
Wheat flour	168,903	150,188	319,091
Fruit and nuts	40,393	71,020	111,413
Iron and steel manufactures	40,326	41,160	81,486
Cotton (raw)	18,680	36,241	54,961
Vegetables	32,478	15,459	47,937
Copper and manufactures	7,429	34,886	42,315
General cargo	222,624	226,340	448,964
Total	1,941,097	3,308,895	5,250,032

Important Income Tax Regulations Are Announced

Regulations governing the keeping of books for the purpose of determining the information necessary for the proper filing of an income tax return have been issued by the United States Internal Revenue Department. The new ruling will undoubtedly necessitate a change in the methods followed by some members of the electrical industry. The regulations follow:

"Every taxpayer carrying on the business of producing, manufacturing, purchasing or selling any commodities or merchandise, except the business of growing and selling products of the soil, shall for the purpose of determining the amount of income under the Revenue Act of 1921, keep such permanent books of account or records, including inventories, as are necessary to establish the amount of gross income and deductions, credits and other information required by an income tax return. The taxpayer shall produce such books of account or records for the inspection of revenue officers duly authorized by law to inspect the same, at such time and in the manner provided by law."

Many Problems Confront Chinese Engineers

At the recent convention of the Association of Chinese and American Engineers held in Peking considerable emphasis was laid on the losses arising from a lack of standardized materials and standard equipment, a problem which is one of the outstanding difficulties in all electrical and other engineering work in China. Some interesting points in this connection were brought out in a paper on power plant installations, and dealing largely with the problems of generation and distribution. China has now an installed capacity of about 280,000 kw. exclusive of a few very small isolated plants, and the demand for power is increasing considerably faster than the supply. The number of modern cotton-spinning mills alone has more than doubled in the past twenty years, and the market for electrical goods grows yearly.

The irregularity and inadequacy of the power supply, it is stated, is due more than anything else to the lack of standardization in design and equipment in the power plants. In a survey recently made of a number of plants it was found that machinery from all parts of the world was used, with various frequencies and a bewildering assortment of generating and distributing voltages. The efficiency of the steam plants was extremely low, and consumers reported that the variation in voltages received was as much as 50 per cent. This lack of voltage regulation has disastrous results on the motors, which burn out rapidly with the overheating resulting from the increased current. It is a common practice to install motors which are much larger than necessary in order to allow for the vagaries of the power supply. The economic waste of operating them at from one-half to three-quarter load is obvious.

Another side of the question of voltage drops is summed up in the pathetic report of the Chinese lamp-salesman who complained, "No can sellee plenty much lamp. Voltage low, lamp no burn out quick."

N.E.L.A. to Study Central Station Radio Situation

Under the chairmanship of N. F. Brady, president of the New York Edison Company, the radio policy sub-committee of the Public Policy Committee of the N.E.L.A. has undertaken an exhaustive study of the wired wireless situation, and, in fact, of the entire radio field, in an effort to establish uniform policy for electric light and power company properties with respect to the radio art.

The committee holds that electric light and power companies of the country are interested in radio from two angles: first, radio as it is known today, and, second, radio in the future. It feels that today's problems are comparatively simple, in most cases being purely mechanical or technical ones dealing with the safeguarding of electric light and power company transmission lines and distribution systems from interference and the simultaneous guarding of radio amateurs from injury or possible death, and the safeguarding of property from damage through thoughtless or careless installations of antennae or unwarranted uses of electric light or power lines.

Some of the questions connected with present-day radio practice for which the committee is endeavoring to find an answer satisfactory to the public and the association membership as a whole are:

"Shall the central station get back of the movement and foster radio telephony in the home by installing broadcasting stations and advocating the use of electric lines as antenna?

"Shall it offer the use of its poles for antenna supports?

"Or, on the other hand, shall it discourage the use of socket antenna attachments and foster municipal ordinances restricting and licensing the installation of radio receiving sets?"

The committee feels that there is great diversity of opinion upon these points both from the viewpoint of good-will building and from the viewpoint of safety and service standards.

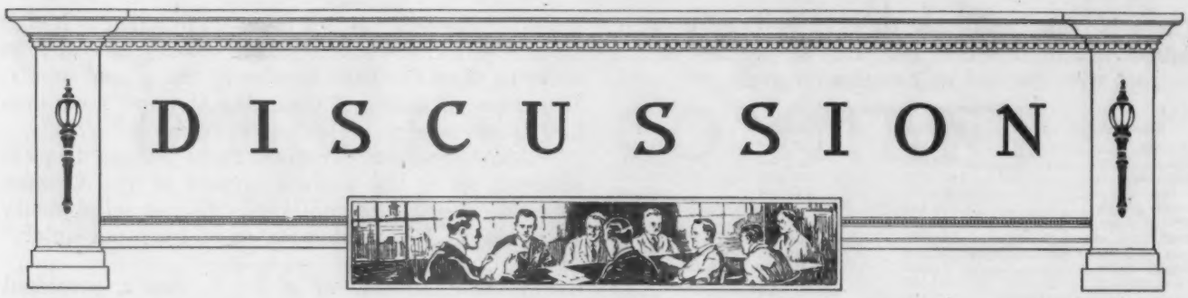
With respect to future developments the committee is now collecting data and having experiments made by leading manufacturers in order to find answers to the following problems and questions and confidently expects to have these answers in hand within the next year:

"Will the development of 'carrier current' make possible the use of existing light and power lines for purposes never before contemplated?

"Will the transmission line serve also as a telephone and control channel, to communicate with the distant station and to operate its equipment?

"Will the street lights of the future be controlled by carrier current transmitted over the distribution mains?

"Will the radio set of the future operate on the lighting circuits in the home and receive its impulses over the same circuits by carrier currents?"



Engineers Disagree with Editorial on Utility Commissioners' Qualifications

To the Editor:

Sir: The Public Affairs Committee of the San Francisco Chapter of the American Association of Engineers was much interested in the recent editorial in the Journal of Electricity and Western Industry on the subject, "Engineering Qualifications Not the Only Ones For Utility Commissioners."

We heartily agree with your conclusion that to recommend that engineers "be appointed merely because they are engineers is exceeding the bounds of sound reasoning."

We do not entirely agree with your description of the ideal commissioner, however. You state that he "must be honest and sincere, he must possess integrity, he must have a knowledge of the law, a knowledge of business, and above all, he must be an able and competent judge." These are all to the point, but why should he not have knowledge of engineering as well as the law and business? It is admitted without question that most of the testimony offered before the commission is by engineers and that the greater proportion of the staff work done on cases is by the commission engineering department. While it is true that this organization is a splendid and well-equipped one, it cannot be gainsaid that two commissioners, who are also engineers, would be most helpful in digesting rapidly and effectively the enormous masses of technical detail which are embodied in the engineering reports coming before the commission.

Furthermore, the commission has legal and financial departments as well as engineering. Why, then, do members of the commission need knowledge of the law and business but not engineering? Is the engineering department so much better able to advise with commissioners than other departments that the members of the commission need only to have a previous groundwork in law and business?

With regard to the quality upon which you lay greatest stress, namely, that a commissioner "must be an able and competent judge," we maintain that the engineer's training and experience fit him preeminently in this respect. It is to be remembered that utility bodies rarely exercise their judicial functions with respect to principles of law, but rather in passing on questions of fact and business procedure. A judge, according to Webster's dictionary, "is one who has skill, knowledge or experience sufficient to decide on the merits of a question or on the quality or value of anything." This the engineer does every day of his life. He is continually weighing the relative merits whether it be of plans, materials, locations, value, or the ideas and contentions of men. If he were to be influenced in his decision by the insistence of clients, salesmen, or subordinates rather than merit, he would not practice long as an engineer.

It is our view, that the engineer who has attained eminence in his profession by training and experience naturally acquires the judicial temperament and that able and competent judges can be found in the engineering profession just as readily as in the legal.

Therefore, it is the firm belief of this committee that a substantial volume of the problems with which the commission has to deal, involve in their consideration and solution, a proper and consistent understanding of engineering principles, not only in their technical aspect but more particularly in their broad and orderly application to the economic and business principles involved in the matters brought before the commission; and it is the further belief of this committee that the professional engineer is particularly fitted by training and experience to grasp understandingly the problems, to analyze and co-ordinate their elements and in a judicial manner to deduce logical and equitable conclusions, thereby contributing materially to the efficient functioning and service of the commission by being included in its membership.

In conclusion, this committee confesses to a mild surprise that a journal usually so devoted to the interests of the engineering profession should have failed to appreciate the primary qualification of engineers as potential material for public utility commissioners.

PUBLIC AFFAIRS COMMITTEE,
San Francisco Chapter, American Association of Engineers.

By CHARLES H. LEE, Chairman,
NEWELL CHARDE,
LOUIS F. LEUREY,
GEO. D. WHITTLE,
T. A. HOPKINS.

San Francisco, Calif.
Dec. 15, 1922.

Let Convention Delegate Report to the Entire Local Section Membership

To the Editor:

Sir: Your editorial, "Solidarity in National Engineering Society Development," in the Oct. 15 issue of the Journal of Electricity and Western Industry, pleads for representation of local sections in the national conventions of the societies. The

value of such representation can not be over-estimated in the interest of cohesion.

However, full advantage should be taken of such representation and every effort made to develop its full value to the sections and members as well as to the society as a whole. With that object in view, it seems that at least one section meeting each year should be set aside for the discussion of the activities of the national society.

Such a meeting, at first, might be held soon after the return of the delegate from the convention and center around his report on the sessions of the convention. At present, he reports presumably to the executive committee of the section, but the members in general glean little or no information and consequently take slight interest in the society's affairs and policies.

After the interest of the members has been awakened by such post-convention meetings, there will probably develop a demand for preconvention meetings so that delegates may go to the convention instructed on specific measures or at least with a clear knowledge as to the attitude of the section on important matters.

Such meetings offer the only means by which sections and members, remote from national headquarters, can secure genuine representation and achieve an active part in the affairs of the society, adequately expressing their needs and desires.

L. N. ROBINSON.

Seattle, Wash.
Dec. 17, 1922.

Educate Both the Electrical and the Non-Electrical Merchants

To the Editor:

Sir: In view of the action taken by various contractor-dealers' associations and electrical leagues in recognizing retail outlets other than those strictly electrical, providing certain standards are maintained, does it not seem advisable to encourage a better understanding on the part of those dealers other than electrical on the basis on which electrical goods should be merchandised?

The field of operations has been qualified in the preceding question because that is the subject of this communication. As a general proposition, it is only too well known that the electrical man is the one needing education on merchandising rather than the hardware or department store proprietor. But in this particular case the point is that of driving home to the industry two things which the latter types of merchants must accept and put into practice.

The cut price problem arises not as a cause but as the result of an improper conception of these two outstanding factors. It would therefore appear advisable to consider these two factors, buying and servicing, as fundamentals.

Unless the store is one so large that it has a separate and complete electrical department, appliances, lamps, etc., are handled by some other supposedly related department. In the case of the department store one may find electrical merchandise in the furniture, hardware, art, house furnishings or other departments. In the hardware store electrical goods are usually classed with the hollow ware, staples or specialties.

It is only logical, then, under the circumstances, that the buyers for those departments supervise the procurement of electrical goods. But here is where the logical seems to conflict and it is the place where the manufacturer and jobbers' salesmen can make their services really felt. With ample stocks available at a nearby jobber's there is no reason why the department store representative should over-buy unless it is because of ignorance. The jobber's salesman should not allow the buyer to lose his head under any circumstances. He should make it clear that hardware or aluminum goods differ materially from electrical merchandise and that smaller stocks must of necessity be bought if a fair profit is to be made on the turnover. Electric washing machines and percolators cannot be bought and sold like trunks and jewelry or furniture and notions!

If standard prices are to be maintained under normal circumstances adherence must be made to this system, or otherwise a cut price sale is staged. The right to reduce stocks is recognized as a principle of good merchandising but not in condonation of extravagant or ill advised buying.

Whether longer discounts would aid or hinder this condition is a question open to debate.

Servicing is the other factor. What percentage of department stores have adequate servicing facilities for the electrical equipment of appliances sold by them? Very small, indeed. And yet the electrical dealer and the central station, to make any kind of a success, must be in a position to service anything, from curling irons to washing machines. Apparently too many department stores consider the sale itself as being the alpha and the omega of the transaction. They do not anticipate the necessity of rendering at least twelve months' satisfactory service.

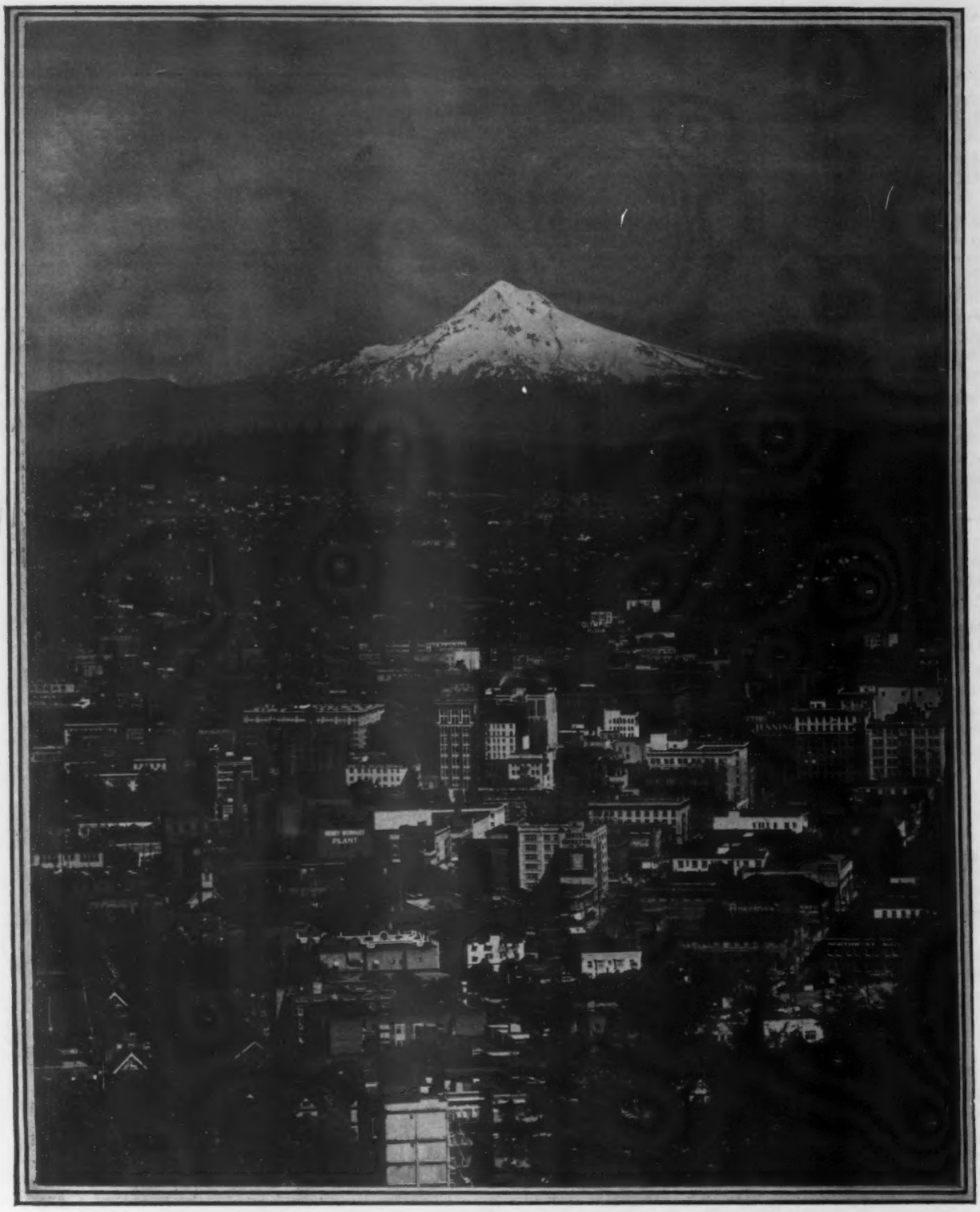
Many department stores handling electrical equipment have phonograph departments. And in nearly every case experts on the repair and upkeep of those musical machines are found in the organization. The same should be true in those places handling vacuum sweepers, washing and sewing machines, and all types of motor driven devices, not to mention the line of heating appliances.

If the customer is to have that satisfaction to which he is entitled in the use of electric equipment or appliances—if the popularity of those devices is to be developed—if the industry as a whole is to be elevated to the position it properly should enjoy—service must be rendered. The instilling of this knowledge in the minds of the department store people must be made.

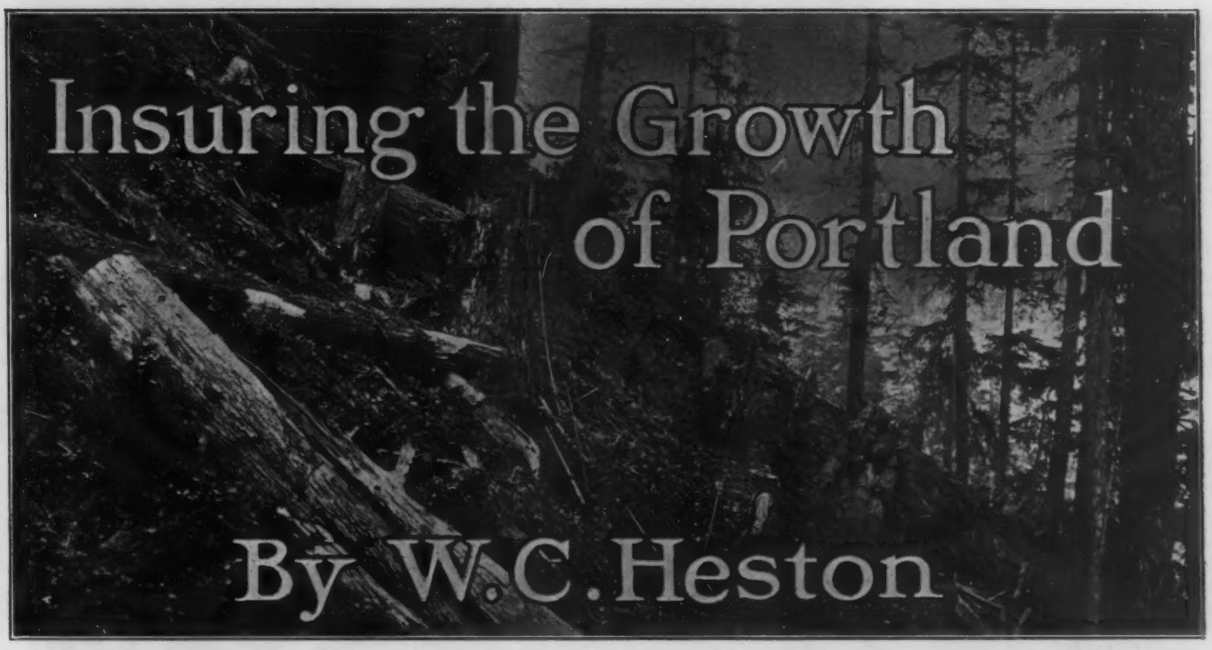
As a matter of self-protection, the rest of the electrical industry can properly demand this—but only after its own house is in order. So why not educate the department stores and help them while the electrical dealer is being helped, to the end that both will profit to the extent they serve?

S. W. BISHOP,
Executive Manager, Rocky Mountain Electrical Cooperative League.

Denver, Colo.,
Dec. 17, 1922.



Water from the melting snows of Mount Hood will turn the turbines in the Oak Grove power house of the Portland Railway Light & Power Company when completed. Seventy-five thousand kilowatts of electrical energy will be made available to meet the demands of the rapidly growing territory in Portland and vicinity served by this progressive company.



Insuring the Growth of Portland

By W. C. Heston

ELECTRIC public utilities must look far ahead in their construction plans to meet the demands which the future will bring upon them. Anticipating the growth of its territory in Portland and vicinity, the Portland Railway Light and Power Company is spending ten million dollars to insure ample power, in order that this growth may not be retarded.

THE completion of the Oak Grove hydroelectric project by the Portland Railway Light & Power Company will bring into Portland a block of hydroelectric power which is very much needed to meet the demand of the growing territory served by that utility. The company at the present time operates four principal hydroelectric plants having an aggregate capacity of approximately 75,000 hp. and two auxiliary steam plants in Portland having a total generating capacity of approximately 25,000 hp. One day during September of this year the peak on this system was approximately 65,000 kw. which is the greatest in the history of the company, thus indicating that the yearly peak which ordinarily occurs during December or January will far exceed that of any previous year on record.

The Diversified Load in Portland

It is interesting to note that the generation curve of this utility has climbed steadily upward in spite of the period of depression which followed the war, when the cessation of activities of the many shipyards, having a load of 5,000 or 6,000 kw. and a monthly consumption of approximately 2,000,000 kw-hr., took place. The explanation for this fact is that the uses for electrical energy, in the territory of 300,000 population served by this company, are so diversified and the growth of the community in the past few years has been so rapid, that the deficit caused by the loss of war industries has more than been absorbed. Resident and apartment house building has been very active, particularly during the past year, and nearly all modern apartment houses being built in the city of Portland are being equipped with electric ranges. There is now an apartment house electric range load of several hundred kilowatts with over 500 electric ranges on the lines of this one company alone. In addition, electric range and water heater sales for residences have been very active.

The Oak Grove project is one of the largest hydroelectric projects under construction in the Northwest at the present time. This plant, which will be situated on the Clackamas River about 60 miles southeast from Portland, will have an ultimate capacity of 75,000 kw. The first unit of 25,000-kw. capacity, will be completed and placed in operation during the early part of 1924, according to present plans.

The company recently placed the order for the hydraulic turbine for this first unit. The turbine, which will be of the vertical type, will have a capacity of 35,000 hp. and operate under an effective head of 857 ft. This unit, which was ordered from the Pelton Water Wheel Company, will be of the Francis or reaction type and will constitute a world's record, both in capacity and operating head for a reaction turbine. It will be similar to the hydraulic turbines at the Kern River No. 3 plant of the Southern California Edison Company. The units at this plant are of 25,000-hp. capacity, operating under a head of 810 ft. An order has just been placed with the General Electric Company for the first generating unit. The generator will be of the vertical type,

rated at 30,000 kva., or approximately 25,000 kw., 11,000 volts, three-phase. Three 10,000-kva. transformers will step up the voltage to 66,000 volts for transmission to the main distributing substation in Portland. Later when the other two generating units are added the transmission voltage will be raised to 115,000 volts.

This project will be unique among hydroelectric projects of the West in that the plant can be operated at full capacity 24 hours a day and for 365

Holt Northern Caterpillar tractor used for pulling stumps and grading

days a year. In other words, the possibilities of water storage are such that the plant can be operated at a load factor of practically 100 per cent. No provision for water storage is being made in connection with the installation of the first unit as the natural flow of the Oak Grove Fork of the Clackamas River is sufficient for the operation of this unit. As the demand for power increases in the territory served by the company, the second and third units will be installed, in connection with the construction of storage reservoirs, one on the Oak Grove Fork and the other on the main fork of the Clackamas River. A 3-mile tunnel will be constructed to divert the water from the storage basin on the main fork of the river to the forebay at the intake on the Oak Grove Fork. The regulating of the flow of the Clackamas River by the storage reservoirs and the release of this water through the turbines at the Oak Grove power house will also make possible a much greater generation of power at the two existing plants on the Clackamas River during the low water period. The first unit will cost about $3,000,000 and the ultimate development approximately $10,000,000.

The initial step in connection with the first unit was the construction of a 25-mile wagon road from the end of the company's present interurban system at Cazadero to the intake dam on the Oak Grove Fork. This road is now approximately 75 per cent completed. The building of a wagon road through the Clackamas River Canyon to the site of this development presented some unusual difficulties due to the fact that solid rock was encountered for the greater part of the distance. The comparatively short dry season during which road construction work could be carried out advantageously made it necessary during the past summer season to make the greatest progress possible. This was done in order that materials could be transported to a distribution point approximately midway between the site of the power plant and the intake dam so that construction work at the power house and the intake might proceed during the winter.

Owing to these facts, and since it was necessary to follow the steep banks of the stream through a narrow valley in a region so rough and inaccessible that construction equipment could be gotten to the proposed line only at the lower end, an unusual procedure in road construction was employed. By operating in the usual way at one end of the work only, the desired speed could not be made and consideration was given to getting small power shovels up the river on barges so that grading could be carried on simultaneously from several different points. A still better plan was finally worked out whereby a small gas-electric shovel was advanced very rapidly over the proposed route, followed by a similar shovel that widened the roadbed and was in turn followed by still another shovel, a standard size steam shovel, that could handle the heavier grading in an economical way.

The first step was to clear the right-of-way and at the same time grade by hand methods a trail wide enough to accommodate a wagon with a 3½-ft. tread. Two such wagons were built and used to convey supplies to the clearing camps maintained ahead of grading operations. The first shovel was a Model 21 Marion gas-electric. It began at the lower end of

Log crib bridge over Three Links Creek near site of the proposed power house

the work and did just enough excavation to enable it to move ahead. In this way, by working three eight-hour shifts, it was advanced 8½ miles in 2½ months, leaving a roadbed for the most part about 8 ft. wide. The crews ahead of this shovel, in addition to clearing the right-of-way, blasted rock making it ready for excavation, using heavy charges so as to facilitate handling with the ¾-cu. yd. dipper. Holt northern logger tractors working behind the shovel were used to remove stumps and pull graders.

A pioneer shovel of the gasoline-electric type followed the narrow trail made by the advance crews.

A second shovel followed and increased the width of the road. Width was sacrificed for speed.

A steam shovel following the two advance shovels increased the roadway to full width.

The second shovel was started out immediately after the first but was expected to handle more yardage and make slower progress. It cut the grade to the prescribed 5 per cent maximum and increased the width of the bench cut to 14 ft. except where long slides or excessively heavy grading was encountered. A steam shovel of standard size came last and completed the work, handling the bulk of the yardage where the cut was deep and heavy.

Gas-electric shovels were selected for the advance work because of the low haulage cost on fuel of this grade and also because of the low fire risk during the summer season, which was an important consideration. At first the light for night work was supplied by a generator driven by the main engine. As this left the work in darkness when the main unit was broken down, a separate lighting system was provided consisting of a Delco storage battery set mounted on a sled. From this leads were run to projectors and lamps placed on the shovel or convenient points about the work.

Only two men were regularly employed on each gas-electric shovel; one of these operated the control mechanism while the second acted as helper and made himself generally useful on the ground.

The work was taken over by the present contractors on May 8. Two and a half months later the first shovel had progressed 8½ miles, the second 6½ miles and the steam shovels had done some very heavy work.

The last operation in the construction of the road is to be the placing of a 15 to 18-in. rock base covered with crushed rock and rolled with 10-ton steam rollers.

The plan of construction by successive stages was worked out by the Hurley-Mason Company, contracting engineers, Portland, Ore., who are constructing the road under contract for the Portland Railway Light & Power Company. The construction of the road will cost approximately half a million dollars and during the past season eight camps were maintained and approximately 1,500 men employed.

Construction Program Large

In addition to the money spent on the Oak Grove project, the company has spent during the year 1922 over $2,000,000 in betterment on substations and the transmission and distribution systems. Approximately a third of a million dollars has been spent on the installation of protective relays alone. This protective relay system will not increase the revenue of the company one cent, but is being carried out solely in the interests of reliability of service.

Approximately three-quarters of a million dollars is to be spent in the construction of transmission lines and outdoor transmission line switching stations. Eleven thousand-volt tie lines will be constructed throughout the city and will be tapped, and stepped down through outdoor substations, located near the center of load in the various residential districts. This will relieve the overloaded conditions of the present 2,300-volt residential feeders radiating from the old established substations. The installation of a 3,000-kw. steam plant in the city of Salem in the upper Willamette Valley has just been completed to supply this city in case of failure of the transmission lines coming from the hydroelectric plants in the vicinity of Portland.

In order to assist in the financing of the Oak Grove hydroelectric project and the large construction program just referred to, the company is offering to the public in the territory it serves $10,000,000 of prior preferred stock. The first $1,000,000 block of this stock has nearly all been disposed of through the employees of the company. A permanent stock sales organization is maintained and as rapidly as the issues are subscribed others will be placed on the market to finance the company's large construction program.

Illustrating the varied character of the country in the Clackamas River canyon. A large part of the road had to be blasted out of solid rock cliffs. Short sections similar to the center view were encountered where construction was comparatively easy. Rock and mud slides were not infrequent. In one instance a steam shovel was completely buried.

Department Store Methods for Merchandising Washing Machines

PICKING haphazardly from among a list of maxims, proverbs and adages, one which best describes the activities of A. A. "Washer" Wilson of Los Angeles in the disposal of washing machines, one might say, "It's the exception that proves the rule." In this case the "rule" is the well established principles and practices of merchandising washing machines as the electrical industry knows them. "Washer" Wilson may not violate all of the principles and practices, but it is a certainty that he sells washing machines in a manner that differs from that of any of his competitors. Moreover, if the reader doubts Mr. Wilson's ability to dispose of equipment for laundering the family linen let him ponder the following facts. In the 13 years that he has been in business, "Washer" Wilson has sold over 1,000 carloads of electric washing machines.

A. A. Wilson who, as "Washer Wilson, is known throughout the Pacific Southwest as the foremost merchandiser of electric washing machines.

There is a touch of romance to the story of Mr. Wilson's success in his chosen line. In 1909 he escorted three of the pioneer dolly-type electric washers into a room on the seventh floor of a down town office building in the city he had selected for his home. During that first year his gross sales amounted to a paltry $5,000, but he learned a lot about selling. During 1922 his sales totaled 130 carloads, the estimated retail value of which is approximately one and a half million dollars. The game was not new to him, though. He was born 44 years ago at Reinbeck, in the native state of most of the world's washing machines, Iowa. For the first twenty years of his life he worked from morning to night on his father's farm. His ambitions, however, pointed toward business and he finally broke away from the farm and took a two years' course in business college, working his own way. Two years of general office work added greatly to his fund of business experience. Then he started to learn selling. The lines he handled while on the road included everything from fancy pottery to farm machinery.

It did not take long for Mr. Wilson to realize that the man in business for himself had the most opportunities. With this in mind he organized the Wilson-Galloway Company at Waterloo, Iowa, handling buggies and farm implements. At the end of a year he sold out and organized, with his brothers, a wholesale neckwear establishment. Two years later his career became mixed up with washing machines. The Wilson Manufacturing Company began to make a hand-operated washing machine. Mr. Wilson was now on the road that has led to business success in the years that followed.

The first venture was not along a path strewn with roses. Shortly after the hand washer was put on the market, a new electrically-driven machine arose to challenge its popularity. Mr. Wilson was not slow to recognize the possibilities of the new machine but he realized that its production called for more capital than he had available. It was natural that he should sell out the factory and start selling the new washer. He chose the West as the seat of his operations and moved to Los Angeles with the agency for one of the pioneer electric washers.

Before he made his decision to build his career around electric washing machines, Mr. Wilson was thoroughly sold on the electrical idea. He had purchased one of the first electrics made and had given it a trial in his own household. They were a novelty, to be sure, and the housewife would require education before they would gain popular acceptance, but they represented a tremendous future sales volume. Experience has shown that he was right. At the present time he not only sells more washing machines than any other single retailer, but he has fifteen stores and is planning to open five more.

To go back to Mr. Wilson's violations of the established rules for merchandising washing machines. In the first place, he employs no solicitors and uses no prospect or mailing lists. He depends upon newspaper advertising alone to bring the prospective purchasers into his store. He does not demonstrate his washing machines in the home nor does he specialize on a free trial offer. Above all, he sells washing machines only,—no side lines, no specials. He does not employ outside men because he be-

lieves that solicitors are the bane of a housewife's existence. He feels that the majority of women would rather do their buying in a store rather than listen to sales arguments when they should be doing housework.

"Washer" Wilson does all his advertising in newspapers because he does not wish to scatter his advertising money and because he wants to be in a position to know absolutely when his advertising is not exerting the proper pull. When he first started selling washing machines he could not afford to use other mediums. Since then he has never felt it necessary to employ them.

Through the newspapers he can get his message to the public with the minimum expenditure of energy and in the shortest length of time. Concentrating on this one medium he can use larger space, give it more attention and become more familiar with getting his message into type. Besides, if sales do not come, he knows immediately what medium is at fault. It cannot be any but newspaper advertising and instead of trying to find the guilty one in a group of methods, he can instantly place his finger on the plug that is not functioning.

An Advertising Copywriter

Mr. Wilson writes all of his own advertising himself. He has done this since he started in the business and even though he has been assured by experts that he could obtain this service at a slight cost he will not change his system. His sales are based on advertising and he feels that the responsibility is his own. In writing his own copy, Mr. Wilson has put across his biggest sales idea. Although his parents gave him two names, the initials of which call for A. A. before his name, he does not use them. Through his advertising he has taught the public to think electric washing machines and "Washer" Wilson at one and the same time.

He is equally careful in his choice of newspapers in which to advertise. In Los Angeles he uses the morning papers only on Sunday. During the week he advertises extensively in the evening papers. He does this because he has found that the working man and the housewife read the evening papers during the week. He is most interested in telling his story to the housewife who has to do her own washing, not to the one whose circumstances are such that she can send the family wash to the laundry. In the smaller communities where his branch stores are located he uses the local papers.

Until a short time ago, the practice on the part of dealers of giving a free trial of the washing machine which they handled was popular. "Washer" Wilson has never countenanced this plan nor does he believe it to be effective.

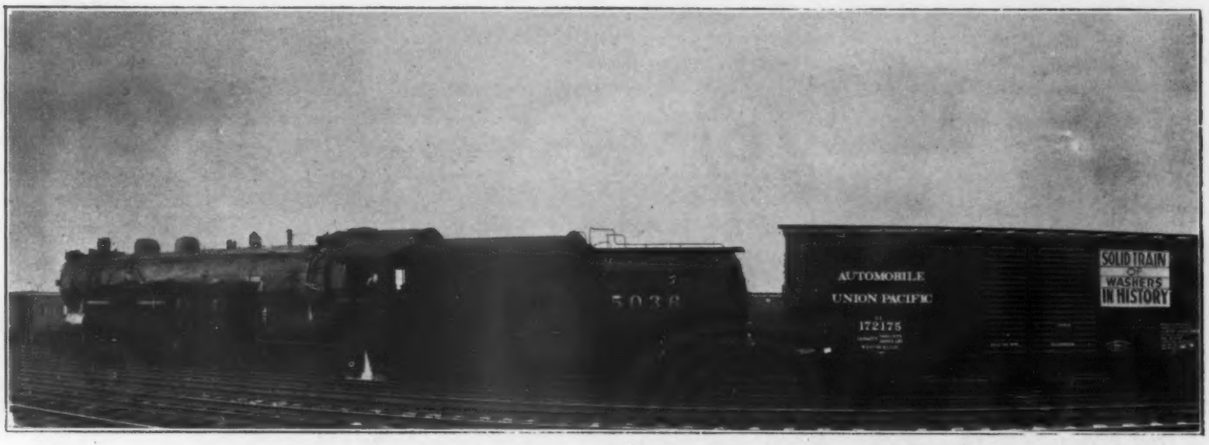
One of his early decisions was to stick to his line. He decided to sell washing machines and not to cloud his reputation with numerous other lines. Since then temptations, backed by merchandising logic have come, but he has turned his back on them all. He could have handled sewing machines. He had the space. He could have pulled more business by offering bargains in sets of aluminum. He has been offered almost every conceivable line on every conceivable sort of a basis. Manufacturers have asked him to take on stocks of lawn mowers, lamps, refrigerators, ranges, and many other articles. He was temptation proof, which is saying a great deal, for there are few dealers averse to taking on a side line which appeals to the same class of buyers as they are already catering to.

Another reason for this was his desire to have every man in his organization a washing machine expert. His salesmen know washing machines, and this knowledge enables them to achieve the maximum efficiency in selling them. He pays his men for this and he pays them well. They work on a salary and bonus basis, with the salary more important than the bonus. Mr. Wilson once said:

"If my salesmen are worth $500 a month to some one else, then they are worth $600 a month to me."

His salesmen are well satisfied, too. Practically every man he has ever employed is still with the organization.

Servicing the machines he has sold is an important part of conducting such a business. Mr. Wilson made no charge for service during the first eight years he was in business. When the number of



A solid trainload of electric washing machines, 35 carloads, comprising the largest shipment on record, sent from the

A. B. C.
ELECTRIC WASHERS
5 MODELS

$99.00 And Up
Payments as Low
AS $5.00-$7.00 Cash PerMo
WASHER WILSON 13 Years in Los Angeles
Phone Bdwy. 1139. 612 S. Spring.
OTHER STORES
Long Beach, San Pedro, Alhambra, Fresno, Santa Monica
Monrovia, Fullerton, Anaheim, Burbank
Glendale, San Bernardino, Huntington Park, Inglewood, Riverside

A picture of the article to be purchased, the price and the terms for which it may be bought are the essential parts of "Washer" Wilson's advertisements, which he writes himself.

machines he had sold became so great that special men had to be employed for servicing alone, then he devised a schedule of nominal service charges, all of which are less than the actual cost to him. In Los Angeles alone, he maintains two service cars.

Eighty per cent of the machines he sells are purchased on terms. He has a liberal credit policy. To him the number of dollars in the bank account or the size of the pay envelope are unimportant. A man with half a dozen children he considers a fine risk. He looks upon the housewife who wishes to buy a washing machine as a thrifty, industrious and steady person who wants to pay her bills. In spite of his liberal credit policy his losses from bad accounts will not reach one-fourth of one per cent of his total annual sales.

In analyzing the spectacular growth of Mr. Wilson's business two of its outstanding characteristics seem to be specialization of effort and generalization of stock. The entire organization has been built around washing machines. They are the only commodity handled and every member of his staff is a specialist on this one subject.

Balancing this specialization is the scope and all-inclusiveness of the stock. All types of washers are included. It has never been the method of Mr. Wilson to accept exclusive agencies, to try to force the product of one manufacturer upon his customers, or even to favor one type of machine over any other. It is his object to carry in stock what the people want in the washing machine market. He will handle any good machine for which there is sufficient demand. But the machine must be a good one. The success of his business and the good will which he has created depend upon the sturdiness and the dependability of the machines which he sells. He has certain definite standards which the machines he handles must meet and there have been cases where manufacturers have altered their product to make them meet these standards.

In view of the tremendous outlets which he has created, the buying power, efficient distribution and quick turnover possible through his organization, he can buy in great quantities. He holds the world's record for a single shipment of washing machines, 35 carloads, 2,500 machines worth $300,000.

"Washer" Wilson is highly enthusiastic over the future of the washing machine business. He does not claim to have any particular corner on success in this business, but maintains that if any responsible dealer will take hold of a good line of washers, devote the proper amount of attention to it, and advertise it correctly, the returns will be highly satisfactory. As he puts it, "Rent, advertising, salaries or commissions and service are the items which must be figured out accurately if one is to make a success of the specialty business."

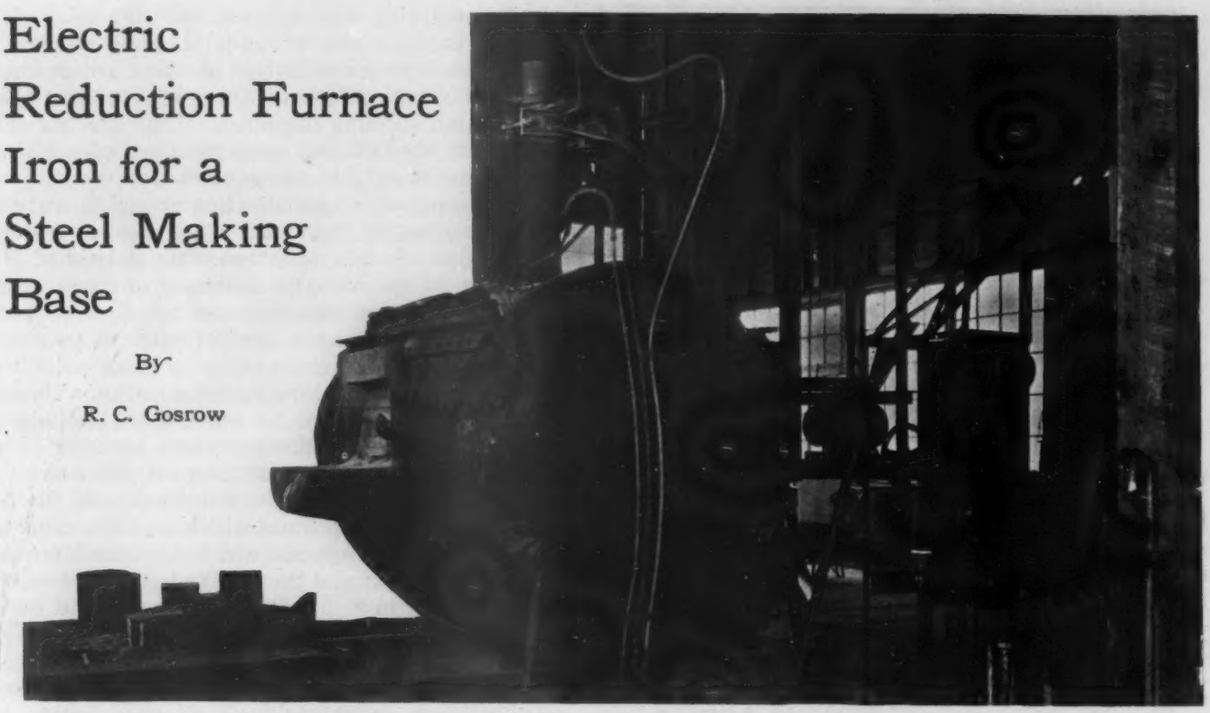
Mr. Wilson has demonstrated that he knows whereof he speaks for not only does he conduct a highly successful business but he is known as the "Washing Machine King" of the Pacific Southwest.

A.B.C. factory to "Washer" Wilson. The shipment moved via the Chicago & Northwestern and Union Pacific systems.

Electric Reduction Furnace Iron for a Steel Making Base

By

R. C. Gosrow



THE electric reduction process for producing iron direct from iron ore, is by no means applicable to all localities. The cost of electric energy, the limitations imposed as a result of unit furnace capacity, the cost of raw materials and the relative proximity of available markets for the sale and consumption of the product, are some of the factors which collectively tend to make the process prohibitive in one region, and economic and operative in another.

In the Pacific Northwest of the United States, and the Province of British Columbia in Canada, the natural conditions and the resources, and the proximity to consuming markets for the product, make the establishment of the electric furnace reduction process a reasonable certainty.

The Northwest regions and other Pacific Coast districts also, possess extensive deposits of smelting iron ores, limestone, dolomite, magnesite, clays, coal, and wood waste to utilize for charcoal. In addition to the ores of iron, there are large deposits, developed and undeveloped, of the ores of manganese, chromium, molybdenum, tungsten, nickel, material for silicon alloys. These minerals are available to transportation from several localities. They represent the raw materials for ferro alloy production for steel manufacture. Water power resources, developed and undeveloped, aggregate millions of horsepower. The proximity of water powers, and extensively developed hydroelectric energy, to the natural mineral resources, are existent. The distribution of electric energy to built-up communities is well established, for industrial purposes.

The geographical locations of built-up and established rail and water transportation centers, interconnecting to all Pacific Coast points, harmonizes every factor essential to manufacture iron, viz.: electric energy at a consistent rate, raw materials, labor markets, commercial contact, proximity to consuming markets, ability to compete with imported products. With these advantages the electric iron reduction furnace has a specific application to a region.

Compared to an iron blast furnace the initial cost of the electric furnace equipment is less. An **apparent** disadvantage of the electric reduction furnace is attributed to its small unit capacity, compared to a blast furnace of an economic capacity. But this apparent disadvantage of unit capacity resolves itself into a strong factor of advantage, in the production of iron for a steel making base. A small unit may be operated in a most flexible manner, and at the same time profitably. It is always capable of conforming to the demand for iron, without the accumulation of large tonnages of "stock iron."

In the production of steel from **steel pig**, the use of the electric reduction furnace iron is economic. The economy of making a heat of steel (.10 to .30 carbon) in an open hearth furnace, is dependent on the rate of melting the charge, and the time required for refining, and the time required to fix the analysis for the product. I refer to the open hearth furnace, because all tonnage steel in the West is so produced, and these furnaces would constitute the demand for pig steel melting stock. In melting steel scrap of low carbon content (.15-.25) the higher temperature of melting, required by the low carbon charge, as compared to a carburized iron of 2.2% carbon, makes the fuel cost ratio higher, also furnace refractory deterioration is greater. Melting a steel pig charge, does not necessarily imply a 100% charge of steel pig, but the charge will contain at least 85% steel

pig. By melting a charge of 85% steel pig, due to a lower melting temperature of the charge, the furnace melting temperature is not maintained or driven so high at the start. Lower flame temperature, and furnace temperature lower, results in lower fuel cost, lower refractory maintenance cost, and lower steam and air cost for oil consumption.

For **steel pig** the range of analysis may be:

Carbon total	2.00—2.25%
Manganese	.50—1.00%
Silicon	.40— .80%
Sulphur and phosphorous under 0.050 each	

Pig steel may be cast in sand, machine cast in steel molds, or cast in slabs and broken with a skull cracker. The metal so produced will be tougher than the blast furnace irons of higher carbon and lower manganese contents. For the same silicon content the grain will show a finer structure, in the electric furnace iron. Although in the white electric irons the fractures are not so widely different from the blast furnace irons, it is in the higher silicons that the different structures are pronounced. It establishes the necessity of grading all electric reduction furnace irons on analysis only.

In the electric reduction furnace, pig steel can be produced at less cost than foundry irons. The unit capacity of the furnace can be of a quantity, so as to be capable of supplying a steady market on a twenty-four hour production load. A 20,000 ton a year furnace can produce steel pig within the buying range of the steel producers on the West Coast.

The use of steel scrap for making steel will not discontinue. By the supplementing of pig steel, where steel scrap is often scarce, and of necessity at a high price, it will stabilize the market for steel scrap, conserve the available supplies, which are quite regular in their cycle of turnover, and to a certain extent revamp the scrap process for open hearth steel making, with advantages in economy and product. The net result to the steel maker will be: a supply of virgin metal, the option to refuse scrap which he considers too low grade to pay for the refining, the elimination from the manufacturing cycle of iron products, materials which were carelessly or conditionally produced.

When steel production tonnage is at normal rate, the demand for scrap is active. In the large eastern steel making centers, the scrap melting stock finds its market and consumption close to the place of scrap production, for the big markets for steel consumption are also the big markets for scrap production. The cycle is completed within a comparatively small area. At the same time virgin metal is constantly being produced, by necessity.

The utilization of the iron producing resources of the West and Northwest are a certainty. The electric reduction furnace has a specific application, under the conditions as they exist, for raw materials, demand for product, and existing markets, of limited and varied demands. The raw materials are at hand, and the thrift of the industry will eventually demand the utilization of these valuable close-to-hand materials for its local supply of iron, for steel making base.

Successful Gasoline Electric Car Is Designed for Swiss Railroad

AS THE result of efforts to manufacture a self-propelled railway car which would combine the utility and flexibility of the electric car and the low installation cost of the gasoline car, Swiss engineers have developed a new car which is said to combine these principles successfully. The car is so designed that the gasoline motor, which is a 200-hp., four-cycle Sulzer engine of the new RV type, can be operated at almost constant speed thus favoring the most economical fuel consumption.

The actual motive power is electricity, a specially designed electrical transmission system mak-

Self-propelled gasoline electric car which is being operated between Winterthur and Frauenfeld, near Zurich, Switzerland

ing variable speeds possible without changing the speed of the gasoline motor.

Under trial tests the car has been found to be extremely economical to operate. The fuel consumption for 1 km. is, when no trailer is attached, 0.6 kg. of gasoline, or approximately 0.262 gal. per mile. Thus a storage capacity of 350 litres (92.47 gal.) would be sufficient to give the car a traveling radius of about 500 km., or 314 miles. Running on a level roadbed, the car, without trailer, can attain a speed of about 44 m.p.h. and with a 20-ton trailer 37.5 m.p.h. can be reached without overcrowding the motor.

The most extensive tests made on the car were conducted on the line between Winterthur and Frauenfeld, near Zurich, Switzerland. The distance between the two towns is 10 miles and on the trip to Frauenfeld from Winterthur, 1.85 gal. of gasoline were consumed. Returning 3.44 gal. were used. Thus a total of 18 kg. of gasoline were used and at the prevailing price of 12 francs per 100 kg. the cost to run the car 20 miles was 2.20 francs or 44 cents.

The car is constructed to operate on standard gage track and is fitted with two driving platforms thus permitting it to be run on tracks where turntables are not available. There are seating accommodations for sixty-nine persons and in the aisles there is standing room for sixteen more. The total length from the front to rear buffers is 70 ft. Five axles are used to support the weight of the car which is approximately 65 tons.

ELECTRICITY IN INDUSTRY

By Louis F. Leurey
Industrial Electrical Engineer

Industrial Applications of Electric Arc Welding Apparatus

THE art of electric welding is now so far past the experimental stage that its use is becoming standard in many fields of industry, as both the equipment and method of application have been vastly improved in the past couple of years. It is,

Fig. 1—Spot welding outfit in the plant of the Columbia Wire & Iron Works, Portland, Ore.

of course, without question true that the process of gas welding will never be completely supplanted by the electrical process because in certain classes of work gas welding has many advantages which will always insure its use. In the same way, electric welding is rapidly developing a distinct value in its field which is pre-eminent over any form of gas welding, and the scope of this field is being widened daily by the conviction which has come to manufacturers from seeing the equipment in actual use.

In the heavy manufacturing field of the eastern states, electric welding received a great impetus during the period of the war. The ship building industry especially found that many irregular pieces which enter into ship construction could be electrically welded with more speed, less labor, and less total cost than by riveting, and use of electricity in fabrication shops became very extensive in many ship yards of the country.

The locomotive industry about this time also made rapid strides in the knowledge and application of electric welding, finding its two principal advantages to be, first, that work could be done on heavy locomotive parts in place, thus preventing the enormous cost of disassembling the machine; second, that the character of the work was such that it left the metal in perfect condition for machining, trimming, or polishing.

About this time, also, many manufacturing companies found that in the fabrication of light sheet steel parts electric welding apparatus could be used with greater advantage than any other devices for assembling these light parts, and manufacturers of electrical equipment especially went very widely into the use of spot welding. A spot welding outfit in operation in the plant of the Columbia Wire & Iron Works, Portland, Ore., may be seen in Fig. 1, which illustrates very clearly the remarkable degree of development this type of welding has reached.

A photograph showing a portable gas driven outfit in use in southern California, reproduced in

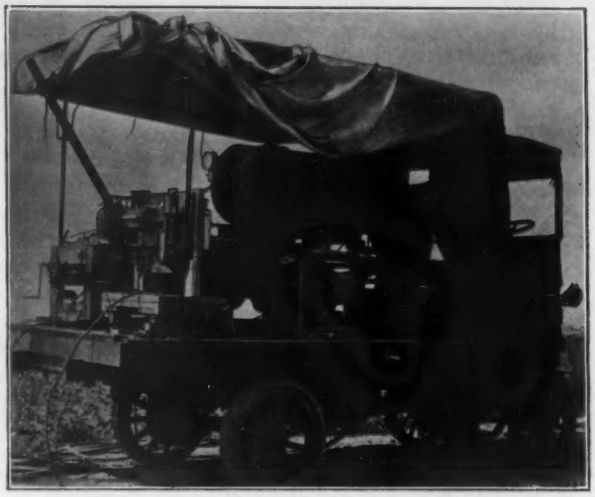


Fig. 2—The portable outfit, pictured above, does electric welding where central station power is not available in southern California.

Fig. 2, shows that the value of the welding process has become so well established that its use is not confined entirely to fields where central station service is available, and its advantages for special classes

of work are such that warrant the high cost of the portable truck and the gas driven generator set.

The field for the application of welding sets in many of the minor shops of the country has been retarded largely due to the fact that it has been difficult and expensive for individual welding equipment companies to properly demonstrate the actual commercial utility of their various machines. It would seem that the time is now ripe for some combined effort by manufacturers of welding equipment, central station companies, and all other members of the electrical industry to initiate steps looking toward central demonstration laboratories at convenient points in large centers of population where these outfits could be demonstrated through all the range of their capacity.

Steel Tower Sections Are Joined by Electric Welding Outfit

THE application of electric arc welding to original manufacturing, as distinguished from salvage and repair work, is growing rapidly, and, as pointed out in the previous article, it will play a larger and larger part in industrial fabrication of iron and steel.

According to Howard L. McLean, of Stockton, Calif., a cave in Calaveras County is the scene of the latest achievement along this line. Here, 200 ft. underground, is a steel tower (Fig. 3) 100 ft. high and nearly 7 ft. in diameter, containing a spiral stairway. Neither bolts nor rivets were used in its construction, as it is electrically welded throughout.

A 300-amp. a.c. welding outfit mounted outside the cave was used in making the 7,221 welds in the tower. One of the greatest difficulties encountered was the conveying of the three tons of steel used, to the point in the cave where the tower was built. The entrance and long passageway to the great central chamber are so narrow and tortuous that no steel bars longer than 20 ft. nor wider than 14 in. could be taken in. This maximum size could only be handled with great difficulty. In addition, material could only be taken as far as a rocky shelf upon which the passageway could be opened, 90 ft. below the earth's surface. This shelf is in the wall of the cave, 100 ft. above the floor. Men and material for the building of the tower had to be lowered from this point to the cave floor by an electric hoist. This shelf also is the upper landing platform of the stairway. Here, a block of reinforced concrete supports two 10-in. I-beams extending out into space. From them, four ¾-in. plow steel cables were dropped to the floor 100 ft. below.

Lengths of machine steel ⅜-in. x 2 in. were then rolled and welded in the form of hoops. At four points on the circumference short pieces of pipe were welded on. The pipe guided the hoops in slipping down the cables. At 10-ft. intervals the hoops were held in place by pouring babbitt into the pipe around the cables. The cables were anchored to the floor of the cave in a block of concrete 8 ft. in diameter and 4½ ft. thick.

The lattice work enclosing the stairway was then started at the bottom. Flat steel bars ¼-in. x 1 in. were used, making one complete turn between each two hoops and crossing at intervals of one foot. In the place of one spiral running from the bottom to the top of the tower, two ⅜-in. x 2-in. steel strips were substituted. These served as the outer support to which the 150 steps were welded. The other

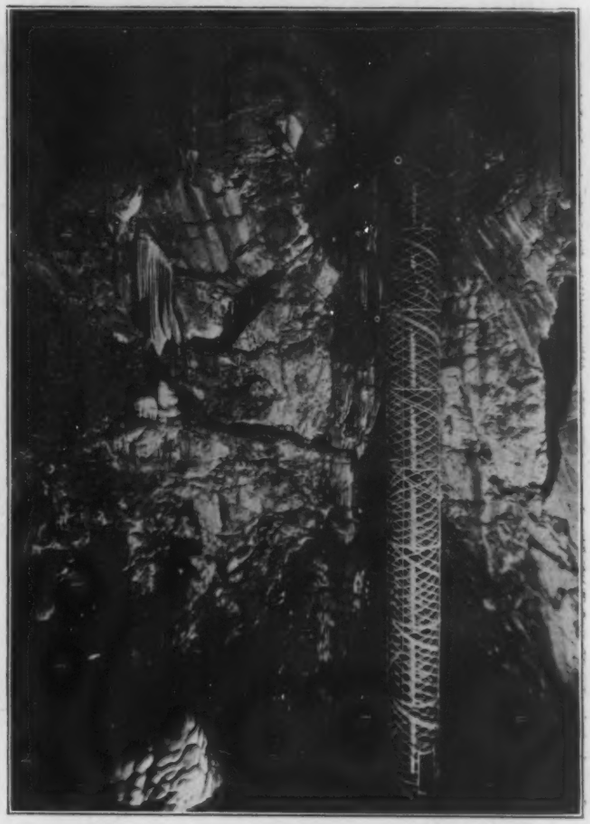


Fig. 3—This underground steel tower in Calaveras County, Calif., is entirely electrically welded

end of the step was shaped and welded to the core of the tower.

Ten-foot sections of 10-in. pipe, electrically welded together, formed the core. This was welded to a bed plate set in the same concrete block that anchored the cable.

One feature of the construction is compactness. The tower serves not only as a means of reaching the floor of the cave but also as a means of ventilating, draining and lighting. The 10-in. center pipe carries the fresh air supply for the cave. It also serves as a conduit for the electric light wires which are led out at intervals along the pipe for lights. A ¾-in. pipe forms a spiral around the center pipe. It serves as a handrail and also as a drain for the seepage water from the platform, preventing the whiteness of the natural formations underneath the platform being discolored.

The invention of the methods of welding construction used and the general design of the tower are due to the construction engineer, A. H. Tangemann of Stockton.

JOBBER, DEALER AND SALES AGENT

While There's Credit There's Hope

By L. R. Ardouin

Electrical contractor-dealers of San Francisco presented this play before the San Francisco Electrical Development League on the annual Electrical Contractors' Day. The play was written to point out some of the weaknesses of the present credit system under which the electrical industry is operating.

CAST OF CHARACTERS

Felix Slick, Cap Gyp, Charley Nickum — Composing the Fly Electric Company — C. F. BUTTE, C. B. KENNEY, C. J. NEWBERY

Arthur Eczema, Sales Virtuoso, Boobs Supply Company....ARTHUR DAHL

Francis Malaria, Swindle Sheet Composer, Bunkem-Joshem Company .....FRANCIS WATTS

Earl Halitosis, President Boobs Supply Company.....E. E. BROWNE

Clyde Cretin, President Bunkem-Joshem Company.....CLYDE CHAMBLIN

Tony Minestrone, A customer.....GUS BARACO

Rodolph Vasselino, Almost the same.....H. ROSENBERG

Twinge I

Show Room, Fly Electric Company.

[The scene opens on a modern electric shoppe, both antique and modern. It is sparkling in its vivacious cleanliness and reeking with the dust of skulduggerous tradition. It is here that rainbows are chased and appliances prescribed with the exact methods prescribed by the coperative campain. But we find among its neatly arranged shelves and its sleeq carpets, three suave men, all shouting raucously and sordidly clawing for gain. There is a charming desk, a perfectly sweet vacuum cleaner, a purring washing machine, a glittering electric iron, and a contracting department ready with its scalpel.

Cap. Gyp is ready with toes on the mark waiting to sell another appliance. Arthur Dahl passes him a cigar salesmanwise.]

Cap. (in Rollo language): Well, Art, old boy, there's a nice order for you. Remember, just because you are giving me an extra ten per cent that does not mean we get all junk.

Art: You know our service is de luxe, Cap, and as for quality, it's the angle worm's eyebrows.

Cap.: Well, Mr. Halitosis is a fine fellow, despite all the publicity given him by the Listerine people, and I like to do business with you.

(As Art starts to make a stagey exit Felix Slick enters, the acme of oily impeccability and calculating gladhandedness.)

Felix: H'lo, Art, old boy, just landed another school house. (Pumps Art's arm with great vigor.) I want some stuff right away.

Cap. (aside): Another school house landed. Another donation handed. Another purse disbanded.

Art (scenting commerce): Have you seen our new household utility, combination hair curler and atomizer? No chilly spray delivered on your whiskers. It heats the spray and makes permanent water waves in your hair.

Cap. (a new appliance on the market makes him delirious): Send up a dozen if they're good.

Art: Our new combination pancake turner and Ford jack is a bear.

Cap.: Send up a dozen.

(Art writes up an order like the allied demands and leaves.)

Felix. You shoulda been up to the association meeting yestiddy after noon. Chamblin was low on the Electrical Building, but we scared him off. He doesn't know how to figger. Its a shame what these contractors don't know about figgerin', or anything at all. He thought the Electric Development League was a new school for physical culture.

Cap.: How did we stand?

Felix: Sitting on the throne at the top, as usual. I must have figgered something twice. (Searches for dandruff.)

Cap.: Tha'ss the trubble. The contracting end of this business, if I may use the expression, is too darn hazardous (blushes). Always taking a chance and what do we get? Always taking our choice between getting a job and losing something or losing a job because we figgered out on paper what it really would cost us and then losing because we didn't get to cut last.

Felix: How comes it that we are in that condition? Say, if it wasn't for the contracting end of this business, we'd be closed up long ago. It looks to me like we're running a service station for the jobber. I'd like to see something tangible in the way of profits.

(Charley Nickum frowsily unruffled enters, bides a wee to register profile, then nervously deliberate, salutes demurely, chaste and purely.)

Charley (in tones mysterious and slithery): Hello, boys. If Mayor Rolph asks for me on the phone, tell him I'm out of town. (Charley exits.)

Cap.: Well, I'm getting in a line from some out of town jippers. I just received a bunch of Jap goods for the holiday trade and closed on the exclusive agency for this block on a combination victrola and fireless cooker. It's called the Pyrola. Music with my meals always did appeal to me.

Felix (answering the telephone): H'lo. Yes, Felix talking. Yes, yes, yes, yes, yes, yes. I'll talk to the bookkeeper (gags mouthpiece, blows dust off set of junk books, searches awkwardly with free hand). (To Cap.): It's Halitosis. He wants money.

Cap.: Stall him. He's too fresh.

Felix: Mr. Halitosis. We sent you a check month before last, didn't we? Our terms have always been 190 days with you. Oh, no, your salesman said to pay whenever we felt like it. (Dramatic pause.) Well, I tell you what you do: You put that check back through the bank again. Maybe they'll honor it this time. (Slides on the receiver and sighs.)

Felix (looking at the mail): Bills, bills, bills; it looks like an Elks' convention. Not a check in the whole outfit except the one on the Pacific States Trade Mark. If I don't land a job soon, we'll be broke.

Cap.: Yes, and wait a year for our money. Well, cheer up, maybe I'll sell a washing machine.

Felix: Yes, and get paid $1 down and $1 eventually, and pay $2 to collect every fifty cents.

(Francis Malaria enters, the epitome of peppy versatility. He is a commanding type of salesman who specializes in opening the dead leads and closing the hard ones, a go-obtainer.)

Cap. (with forced joviality quite apparent): How's the Bunkem-Joshem? Heh, heh!

(Francis repartees hackishly and bursts a bottle of champagne over the bow of his gold medal selling talk and slides her down the ways, but somebody forgot to fill the ocean with water and he falls down like a day-old glass of root beer.)

This new household utility is a combination hair-curler and atomizer which heats the spray and makes permanent water-waves on a bald head.
Your creditors have ordered you closed up. (right)
This iron has an attachment which consumes all odors
Dassa iron no good!
We better treat him well; maybe we can use him later
He thought the Electrical Development League was a new School of Physical Culture
We trusted them, We trusted them, and we never collected a cent.

Cap.: Call around again, Francis. (Aside to Felix): Better be nice to him, maybe we'll need him later. (To Francis): We're pretty well hooked up now. Nothing personal, y'understand, but, but not just now.

(Charley Nickum enters.) Charley: I'm going up to a private session of the board of supervisors. If Bill Crocker or any of the Spreckels boys calls up, tell them to call me up at my home.

(Charley exits like Houdini.)

Felix: Yes (up the scale), yes, yes, yes, yes. (To Cap.): It's Halitosis again. He wants money.

Cap.: Shoot him the hop.

Felix: Well, there must be something wrong, Mr. Halitosis. We'll send you another check right away. Oh, no, no, no, no, no, it'll be on a different bank this time.

Cap.: He's getting too fresh. It makes me sick the way those jobbers chase the dough. You'd think that's all they were in business for—to make money. Their salesmen come in with a lot of bunk and tell us what wonderful service they give.

(Tony Minestrone enters. He's a customer, never mind what he looks like. He talks Neapolitan English.)

Cap. (with the proper approach): What can I do for you?

Tony: I'm going to build a little house.

Cap. (with grandiose wave): Ah (raising eyebrows), ah! I shall introduce you to our contracting electrical engineering manager. (Sweeps Felix forward, who comes up beaming.)

Felix (still beaming): Yes, a house. There are a few things I would advise. First, everything in the best conduit and at least six convenience outlets in every room including the attic. Now, your wife will want an electric range, washing machine and ironer.

Tony: You don't understand, I just want to buy a pair of hinges.

Cap.: Let me show you this new electric iron. It's a wonder. It is guaranteed for ten years. (Cap. spreads eagles for an hour, and blahs Tony into a sale.)

(Tony exits.)

(Charley enters.)

Charley: If there are any telegrams from the executive mansion, send them out to Captain Dollars' hunting lodge to me.

(Telephone rings as Charley exits.)

Cap. (answering telephone): Yes, Mr. Halitosis. We'll be right over.

(To Felix): He acts irritated. Let's go over and see him.

Felix: All right, anything you say. But there are plenty of other jobbers. [Curtain.]

Twitch II

Office, Boobs Supply Company.

Halitosis (lion-like): Send 'em up. I've been waiting for them.

(Enter Felix and Cap.)

Cap. (magnanimously defiant): Well, here we are.

Halitosis: Well, we might as well get down to business. I have a few words to say and you might as well hear those few right now. I suppose you know the condition of your account on our books?

Felix: Sure, we keep books.

Halitosis: Well, I've received promises, notes and checks which have never been met and before I commence any action against you, I'd like to give you a chance to say something for yourselves.

Cap.: We haven't anything to say.

Felix: Sure, go ahead and sue us. We haven't anything on our shelves that we didn't buy from you. You've been getting all our business. Isn't that enough?

Halitosis: It would be fine if I got any money for my goods.

Cap.: We have to repair pretty near every appliance we sell. It eats up all the profit.

Halitosis: Well, it's not my fault. Either make some cash settlement or we sell you on a c.o.d. basis.

Cap. and Felix (in unison): All right, anything you say. (They exit.)

Halitosis (calling up Cretin of Bunkem-Joshem):

I've just told the Fly Electric that they are on a c.o.d. basis. I thought that might be interesting information for you to govern yourself by. I'll come right over now and give you the details.

(Exits.) [Curtain.]

Twist III

Same as Twaddle I. Six months later.

Charley (to Cap.): Here's some cards to give out to your friends. I expect to be pretty busy the next month or so. I was the last one to file. The boys coaxed me so hard and even the sheriff himself wanted me to do it. So I'm going to take a try. I'm going up to a private session of the board now. Tell anybody who calls I'm out of town till tomorrow.

(Exits immediately.)

Felix (entering with roll of plans): Well, here's where we chase another rainbow.

Cap.: Yeh, that's about all you do. You must wear out about a gross of lead pencils and a square mile of shoe leather every month chasing jobs.

(Art enters and tries to be cheerio. His reception is as pleasant as a rubber pancake.)

Cap.: Can't you see I'm busy? Get out.

(Art exits most assiduously.)

Felix: I'm glad we switched to Bunkem-Joshem. I never did like that guy, anyway.

(Enter Rudolph Vasselino): I want to buy an electric iron. One that I can fry eggs on in my hotel.

Cap.: Sure, we have one here that has an attachment to consume all the odors. It's guaranteed for ten years. It sells for $5.

Rudolph: Maybe you have one slightly damaged you could sell cheaper.

(Cap. almost has talked him into an order when Tony enters.)

Tony: Say, here's that iron you sold me. It doesn't work well. It nearly killed my family. I thought it was guaranteed for ten years

Cap. (stalling): Sure it is. Maybe you didn't use it right. Maybe the children were playing with it. We'll let it heat up. (Attaches it to plug.) While it's getting hot let me show you this masticator, the new washer made by the Horace Fletcher Company. (Tries to start it and it falls to pieces.)

(Cap. goes from a warm to a cold sweat. Every appliance that he tries to show goes phoney. Finally the iron itself blows up and the customers exit disgustedly.)

Charley (comes in with a ray of sunshine): Well, boys, it looks like I'm in. Let's all go out and celebrate.

(They exit.) [Curtain.]

Twitter III

Office of the Bunkem-Joshem Supply Company, Amalgamated, Credit, Ltd.

[Cretin and Halitosis seated at desk together, mournful objects.]

Cretin: Here we are with all our money and assets in one pot and trying to make both ends meet just on account of one contractor.

Halitosis: Doggone the Fly Electric. Misery loves company. Even after I told you how they got into me, you took them on and gave them credit; but I'm willing to let bygones be bygones. All our help laid off and doing the work ourselves. It's too bad.

Cretin: They stalled me and stalled me. I couldn't sue because they didn't have anything. (They sing to the tune of The Expurgated Rhapsody.) I trusted them and trusted them and never collected a cent.

Cretin: If we go down we'll take them down with us.

(Gets Fly Electric Company on phone): Yes, all of you guys come right up here. The whole darn firm. (Slams receiver on hook.) We'll give them a nice surprise and close them up with fireworks. (Calls sheriff's office.) Send down the sheriff himself right away. We have important business for him.

(Cretin and Halitosis watch clock for twenty-nine minutes.)

(Enter Felix, Cap and Charley.)

Charley: Did you call for me?

Cretin: Yes, the three of you.

Charley: I was just on my way down here, anyway. My deputy gave me this (starts to unroll sign).

Halitosis: What's that? Waw-waw, what's the idea?

Charley: That's a notice of sheriff's sale. Your creditors have ordered you closed.

Cretin: What are you doing with it?

Charley: Don't you know? I was elected sheriff yesterday and I'm serving this notice for the benefit of your creditors. [Curtain.]

One of the tables with heaters installed by the H. L. Miller Company of Pasadena, Calif., in the park where election returns were broadcasted

Election Heating Installation Advertises Dealer

Wires and wireless were used by the Pasadena Star-News to broadcast the returns in the recent election to the crowds gathered in Library Park adjacent to the newspaper's offices at Pasadena, Calif. At the same time the H. L. Miller Company, electrical contractors and dealers, used wires to spread the advertising message of the company.

Even in sunny southern California the nights are cool in November. In Los Angeles the gas company advertises the coke which is a by-product of gas manufacture by burning briquettes in open grates before its offices on cold evenings. One of the newspaper staff noted this practice and decided that it would prove an effective means of supplying heat to those who intended to watch the election returns supplied by his paper. However, the gas company was not interested in advertising its products in a city which it did not serve.

The newspaper man spoke of his difficulties to H. L. Miller, who immediately recognized a chance to advertise his own appliances. Mr. Miller agreed to supply sufficient electric heaters for the purpose, provided the newspaper would arrange for the power supply. The municipal light department offered to give the current free of charge and install the power outlets.

Mr. Miller constructed four large tables, each capable of holding six "Cozy Glow" electric heaters. Over each table a large sign was hung giving the name of the heater and the company which furnished them. Throughout the evening from seven o'clock until midnight, hundreds of people gathered about the tables, warming themselves. A great deal of good will for the firm was created and the advertising value of the installation was inestimable. A number of sales directly traceable to the installation were made during the days immediately following.

Mention of the cooperation of the contractor-dealer was made twice during the days preceding the election in the editorial columns of the paper.

SOME SNAPPY NEW YEAR RESOLUTIONS

By JOE OSIER

Now that "Kid '22" has taken one on the point of his withered jowls and gone for the Big Sleep and—

"Kid '23" has been crowned King for a year—

Men engaged in the Electrical Industry can turn a smart trick by retreating into themselves and spending a few minutes in composing some high-class resolutions to govern their actions during the coming twelve months.

By this, I do not mean that they should resolve to forego buying bonds or brew—foreswear cards, cursing or gum chewing or that they should promise to walk the straight and impossible path until—

Comes the time next year for making a new set of fragile promises.

Personally, seeing that I have already resolved to swear off swearing off, I am willing to let the namby pamby promises go to pot and content myself with a set of high-class resolutions which any fair-minded man of business will keep, in order that his business may prosper.

To be brief, which I hate to be, seeing that I am barely started on this column,—

I would, if I were engaged in the Electrical Industry, adopt the following resolutions and—

I would practice and preach them from dawn until darkness every day of the year which has just arrived.

1.—I shall be just to my employees, giving them a fair share of that which they so willingly produce. I shall be considerate of their feelings. I shall reward their ambitious efforts.

2.—I shall be fair in my dealings with men who favor me with their business. I shall not attempt to flay them, skin them, nor will I flim flam or double cross them in any way.

3.—I shall throw a calloused eye on Overhead, watching this item as a mother watches her babe; as Uncle Sam watches Mexico. Yea, verily, I shall keep it down to a minimum, consistent with good business practices, in order that I may continue growing and prospering and waxing wealthy.

4.—I shall pay my dues in my Association, attend all meetings, participate in all Association activities. I shall lift my voice in council—wisely if possible; however, either way, I shall lift it.

5.—I shall subscribe to and read the columns of publications published in the interest of the electrical trade, knowing, full well, that brighter men than I am Gunga Din, have consumed many hours of time and kilowatts of current in the preparation of articles and editorial comment which are meant to aid and abet me. Again, Verily, I say: Their brains and head muscles shall not have been organized and co-ordinated in vain.

6.—I shall not "use" with the "curbstone" electrician;—that lowly wight who carries his shop in a satchel. To him I shall accord short shrift. I shall avoid him as though he were the Flumonia or the palsyals.

7.—I shall not buy jobs. If my services are not worth something—including some money, I shall find myself a busy corner and an empty can. While contracts are going for nothing, I shall sit in my shop, free from the fear of the sheriff, and practice rolling muzzle loading cigarettes with one hand.

8.—I shall keep the above resolves, knowing that I shall be rewarded with a fair portion of the gate when the receipts have been counted on the last day of the last month of this year. And, further, I shall rest assured in the knowledge that my cash register will not be worn out from ringing "No Sale."

Selah! I have said it!

SOLD TO Smith, Mrs A.F. ADDRESS 1715 Fedora Ave. Fresno WATER HEATER
MOVED OR TRANSFD TO YES

MAKE Hotpoint TYPE 11RA67 SER. NO. 18494 Install. order # 100 PURCHD FROM Pac St
SOLD BY Downing DATE 9/8'22 PRICE $ 223.50 CASH P. O. 9605 DATE 7/17'22
SPEC. DISCT. WHY? SERVICE UNTIL 9/14'23 RECD 9/23'22 CL
INSTALLED BY U.S. - Petty DATE 9/14'22 INSTALL COST $ 54.63 LIST $ 223.50 COST $ 173.25

ELEMENTS	WATTS	DATE	REP. ORD.	WATTS	NATURE OF REPAIRS	COST	CHGE	DATE	REP. ORD.	WATTS	NATURE OF REPAIRS	COST	CHGE
FRONT R	1500												
C													
L	1000												
REAR R	440												
C													
L	1000												
OVEN T	1500												
B	1500												
BROILER													
MISCEL													

NAME Smith, A.F. ADDRESS 1715 Fedora Fresno

Fig. 1—Water heater record card of the Valley Electrical Supply Company

Selling Service with Heavy Electrical Appliances

Fresno Firm Insures Against Lengthy Operation Interruptions by Recording Data on Electrical Devices Marketed

Supplying a service which permits the selling of extra elements for electric ranges, much the same as spare tires are sold to automobile owners, has been the policy of the Valley Electrical Supply Company of Fresno, one of the most progressive electrical stores in central California. Every effort to make the sale of all electric appliances a lasting one and one which will attract more business to the firm has been applied by this company.

Because much of the business that is handled by the company comes from the agricultural territory surrounding Fresno, ample precautions to provide continuous service, from the appliances sold, are necessary. Farmers living some distance from town are urged to purchase extra elements in order that their electric ranges may suffer no interruption of service. Detailed instructions as to the installation of the spare elements in the range are given the purchaser and he is thus able to keep his electric range in order. Any serious trouble must, of course, be referred to an experienced electrician.

The service provided is based upon the idea that the sale of electric ranges or any other piece of electrical equipment, is not ended when the customer has paid the bill for the goods. The experience of the company has taught H. H. Courtright, manager of the concern, that the sale of one electric appliance will often lead to the sale of many other appliances, each a larger investment than the previous purchase, if the customer is well satisfied with the first purchase. From the observations made, the company realizes that to secure more business it is first necessary to completely satisfy and even anticipate the wants of its customers. Thus the policy of servicing and of providing for possible breakdown of appliances has come as a natural result.

The servicing policy of the Valley Electrical Supply Company starts when the sale of the range is completed. When the range is delivered, all information in regard to it is entered upon a special card form, a sample of which is shown (Fig. 1), indicating the type, nature and size of elements, and other information which gives the company complete data concerning the range at the time it left the store. These blank forms when filled in are sent to the range department where they are filed alphabetically according to the customer's name. In this way information concerning any purchaser's range is always available to the men in charge of the department. Should any spare parts be needed it is not necessary for a man to go to the home of the range owner to ascertain the type and size of replacement part necessary, but the card record enables him to secure the information at the company's office. This also prevents the waste of time occasioned by a man taking the wrong sized part to the customer, as his requests for parts are always checked against the blanks in the range department's files.

Wireman will fill in here wattage of range elements as originally installed by him.

Front R 1500 /
C
L 1000 /
Rear R 440 /
C
L 1000 /
Oven T 1500 /
B 1500 /
Broiler

Water Heater data to be filled in by installing wireman

Boiler Size 24 g /
Lagging O.K. /

RANGE AND WATER HEATER SERVICE
INSTALLATION — REPAIR ORDER NO. № 100

Install—~~Repair~~—RANGE—Make Hotpoint Type 11 RA 67 Ser. No. 18494
Install—~~Repair~~—WATERHEATER—Make Edison Type 433 W7 Ser. No. V2041
Watts 3000 Volts 220 ~~Non~~ Aut. Control Ed. 415 Y/4 Lagging J.M. 2 ply
At Mrs A.E. Smith,
Address 1715 Fedora Ave, Fresno
~~Trouble reported as:~~ Installation

Take Range, W.H and Jacket as per above

Special Instructions Be careful of kitchen walls and floor - Floortiling imported and hard to replace

Order received by Downing Date 9/10 1922 10 A. M. ~~P. M.~~
Installation—~~Repairs~~—made by Petty Date 9/14 1922
Charge to: Service Manufacturer Jobber (Customer)
By Authority of F.S.T.

Fig. 2—Combination installation and repair order blank. Note the special instructions to service men.

As this company is also in the electrical contracting business it installs the ranges that it sells to its customers. The information as to installation is also entered upon the individual record blanks. Records of the installation show who did the work and who inspected the job when completed. A space permitting a record of three years' operation and repair is provided on the card and reports on what repairs were needed, with all details and the costs of doing the work are entered as the conditions require.

Information, concerning the repairs necessary, is secured from card forms supplied to repairmen (Fig. 2). These forms are made out in duplicate and carry spaces for information regarding the work done by the man on the job. The amount of material used, with the cost of this material, the time consumed and any special remarks are entered by the repairman and a copy is sent to the range department for entering on the individual files.

Installation order blanks given to the workmen of the company are the same as the repair order blanks. Record blanks of the purchase of ranges and water heaters differ only in the color of the stock used. The former being printed on blue bristol board and the water heater records are kept upon yellow stock of the same grade of paper.

Personal contact between the company and its customers is made possible through the use of these record cards. When a man goes out on a job he makes his name known to the homeowner and is instructed to call the housewife by name. If, after installation, any other attention is required to keep the appliances in condition, the repair man who is sent out has previously seen the record card of the particular installation and has noted any former repairs, or special equipment notations.

On entering the house the repairman introduces himself and tells the housewife the name of the man who worked on the job the last time. As he has recently seen the record card he can talk intelligently concerning the installation and in this way shows the owner that the company has an interest in the work that has been done before. Men placing ranges and water heaters for the first time are advised of the condition of the house and are warned to be careful of certain fixtures or fittings.

This intimate knowledge with the job at hand impresses the home-owner with the care and attention that is given by the company to individual installations. This feeling among customers of the company has been found to be of inestimable value. A considerable amount of good-will has been secured and customers have been ready to recommend the service of the Valley Electrical Supply Company to other prospective customers.

One of the main reasons for keeping the range and water heater installation and record cards is the desire of the company to obtain accurate statistics on the service furnished by the different types and makes of these devices. The plan at present is to keep these record cards for a five-year period and then to make a comparison of the service records of the different manufacturers' products.

These comparative charts will show how each separate unit held up under actual service conditions. Heating elements and all of the constituent parts will be compared with units of like size in other makes of ranges and water heaters.

This information will be taken from the record blanks which are kept in the files of the range and water heater departments. Consideration as to the length of time the appliance has been installed will be noted and allowance will be made for this.

The company feels that in this way, it can determine for itself the best brand of range and water heater and can then specialize on those makes. The test of the electric range is its operation, the company believes, and it plans to keep these records so that it may know the results of the test and can then be best fitted to serve its customers.

Merchandising Aid Offered by Manufacturing Company

Carrying out the policy of cooperating with the electrical dealer at every possible place, the Westinghouse Electric & Manufacturing Company's San Francisco office has adopted a rather original method of obtaining contact with the dealer. The publicity department of the organization has taken over the new work and is endeavoring to create greater merchandising efficiency in every store that handles the Westinghouse products.

Members of the department call upon the dealers, not as salesmen but as counselors to the men of the trade. These counselors aid in the decoration of show windows, give advice on advertising and accounting methods and on stock-keeping systems. They endeavor to help the dealer solve his own particular problems. No set of rules are followed by the publicity department representatives, as they feel that the individual problems of the dealer can best be solved by a close examination into the particular case. Thus a service is given to the dealer, which will provide greater sales for him and at the same time aid the manufacturer of the electrical equipment in placing its goods before the public in the best manner.

No charge is made for this service and it is given to any dealer who requests it from the company. It is the policy of the publicity department to call on the dealers, and before these calls are made, an introductory letter is written to inform the dealer of the intended call of the representative. This paves the way for the call and gives the dealer time to prepare any questions he may want to place before the manufacturer's representative.

In the letter which is sent to the dealer is inserted a printed card which provides space for him to indicate what sort of information he desires to receive from the manufacturer. Through this card the dealer can order supplies of folders, letters, advertising cuts, lantern slides, window display ideas, or catalogs. Space for requests for suggestions on bookkeeping systems, mail advertising ideas and newspaper advertisements are also provided. Prompt attention is given these cards when returned to the publicity department.

The letter which is sent out to the dealer in advance of the call of the publicity department representative is

Date_____ 19__

Dear Mr. Scanlon:

We need the following supplies—

√	Kind	Quantity	Appliance
	Folder		
	Letter		
	Ad Cut		
	Lantern Slides		
	Window Display		
	Catalogue		

Can you give us some suggestions on our—.

	Window Displays		Mail Advertising
	Bookkeeping System		Newspaper Ads

Remarks:

☐ Please send us "Contact."
☐ What other magazines should we read?
☐ How can we get your financial help on our newspaper advertising?

Name_____ Firm_____

Place_____ _____

Note: Check √ items desired.

The return post card which accompanies each letter

called an "Idea Letter." The first one of these letters, which are in series form, is printed below.

Subject: I'M COMING TO SEE YOU

This isn't a sales letter nor an advertisement. It is only

AN INTRODUCTION.

I do not want to have to explain who I am and why I came when I come to see you, so I am telling you here. It is good business sometimes to send ahead a little friendly letter to tell your business, because it saves the other fellow's time as well as your own. When you meet you don't have to stall around getting acquainted. That's done already—by the letter.

I'M COMING TO SEE YOU ABOUT WASHING YOUR WINDOWS—if they need it. Not that I think they do, but just to speak figuratively. I helped a man to put in a little window display a month ago and he hasn't taken it out yet! Maybe it was an attractive display, but that is no reason for not changing it, washing the window, dusting the floor, and putting in another more attractive trim.

Window displays are not the only things which get dusty and out of date after serving their time well in the store. Sales policies, ways of advertising, accounting systems, stock-keeping methods, and every detail of organization gets rusty or wears out gradually and needs continual renewing and improving.

The question is, "WHAT, HOW, and WHEN shall this renewing take place?" Here and there, one at a time, I hope to be able to give you answers to these questions through these IDEA LETTERS and through more personal letters and calls.

Within the Westinghouse organization, I am called a Promotion Representative but I trust that you will receive me as a working partner, not on your pay roll, but ready with my coat off to give you information and ideas and to help put those ideas to work for you. This is not charity. It is business. It means more business for us in the long run and it will mean more business for you almost as soon as you shake my hand.

If you really want to shake hands with me now and can't quite reach me, just sign the card and send it in.

I'm mighty glad to meet you, Sir!

M. W. SCANLON,
Publicity Representative.

INDUSTRIAL NEWS

Oregon Power Companies Plan to Have Interconnection

Negotiations are under way between the Portland Railway Light & Power Company and the Mountain States Power Company, for a connection between the two systems which will supply a means of interchange of electric energy, acording to the announcement recently made by the latter company. Both companies operate considerable properties in the Willamette Valley—the Portland company including everything as far south as Salem and the Mountain States company supplying Albany, Springfield, Corvallis and vicinity to the south.

The two systems would be connected, according to the plans, by using the high tension lines of the Oregon Electric Railway Company between Albany and Salem, a distance of 25 miles. As the Mountain States Power Company is already connected with The California Oregon Power Company to the south, the new plan would mean a physical connection of power lines all the way from Portland, Ore., to San Diego, Calif.

Governing Body of Information Committee Is Enlarged

Increased activities for the coming year on the part of the Rocky Mountain Committee on Public Utility Information, which covers Colorado, New Mexico and Wyoming, necessitate a larger organization. As a result, the committee, at its annual election last week, added six central station men to its governing body.

The new members are C. N. Stannard, vice-president and general manager of the Denver Gas & Electric Light Company; Ernest Stenger, receiver for the Denver Tramway Company; George Bixler, department of publicity, Denver Gas & Electric Light Company; George Wehrle, superintendent gas department, Denver Gas & Electric Light Company; Paul Darrow, Greeley Gas & Fuel Company, Greeley, Colo.; W. A. Tobias, Otero County Gas Company, La Junta, Colo., and Ben S. Read, president, Mountain States Telephone & Telegraph Company, Denver, Colo.

Because of the splendid results attending the committee's work for the first year, it was unanimously decided to continue the organization indefinitely. A budget committee is now engaged in making a survey to determine ways and means of continuing activities on the enlarged scale contemplated in the plans formulated at the annual meeting.

W. C. Sterne, president of the Municipal Properties Company, which operates in several Colorado localities, was re-elected secretary-treasurer. E. A. Phinney of the Jefferson County Power Company, Golden, Colo., was elected vice-chairman. George E. Lewis will continue in charge of the committee's headquarters in Denver, in the capacity of executive manager.

Mining Company Is to Increase Power Plant Capacity

The Granby Consolidated Mining, Smelting & Power Company is constructing an addition to its power plant at Anyox, British Columbia, and will install therein a 5,000-hp. vertical reaction turbine, designed by the Pelton Water Wheel Company, and which is to be built at the works of its associated company, the Dominion Engineering Works, Ltd., of Montreal.

The Granby company operates a copper mine and pyritic smelter at Anyox. The main power plant was constructed in 1913, and is situated on tidewater, the turbines discharging directly into Granby Bay.

A notable feature is the fact that normally all the requirements of both mine and smelter have been supplied by water power. Not only are the electric generators driven by Pelton impulse turbines, but other similar units, drive blowers, blowing-machines and compressors. The total installed water-wheel capacity is 8,400 hp. During the war, a steam standby plant was constructed and it is largely to eliminate the necessity for operating this plant that the extension of the hydroelectric plant is being made.

Water is obtained from Falls Creek, a diversion dam, which also provides a small amount of storage, having been constructed about a mile from the plant. To insure sufficient flow during the low-water period to provide for the increased requirements, an additional dam for storage alone has been constructed about two miles farther up-stream. The new turbine will operate under the same effective head as the present equipment, approximately 370 ft.

The Grays Harbor Northern Railroad, recently incorporated in Seattle with a capital stock of $1,000,000, plans the construction of a railroad from Moclips north and northeast through the Olympic Peninsula forest reserve to connect with the government spruce railroad in the vicinity of Lake Pleasant, Clallam County. The line will be built to tap the great timber resources of that region. Incorporators of the company are John Cain, of Port Angeles; Oliver S. Morris of Hoquiam; F. W. Hastert of Aberdeen; J. W. Lawlor of Puyallup and S. A. Dice of Seattle.

Commission Will Try to Enforce Union Depot Erection

The California State Railroad Commission will apply to the Supreme Court for a rehearing in the Los Angeles terminal cases, in which the court held that the commission did not have jurisdiction to order the construction of a union passenger depot. In the event that the order of the Supreme Court becomes final the commission will initiate proceedings before the Interstate Commerce Commission looking to cooperative action to accomplish the result sought.

This announcement made by the commission follows the decision of the California Supreme Court annulling its order directing the Southern Pacific, the Santa Fe and the Salt Lake (Union Pacific) to join in the construction of a union depot as part of a plan for eliminating grade crossings and solving an acute traffic situation. The Supreme Court, while apparently conceding the power of the commission to order the elimination of grade crossings, held that the Interstate Commerce Commission under the Transportation Act of 1920 was given exclusive power over all extensions of railroad facilities including terminals. The court further held that the exercise of the state's power over grade crossings is not necessarily inconsistent with the concurrent exercise of the power of the Interstate Commerce Commission over terminal facilities.

In announcing its decision to apply to the Interstate Commerce Commission for cooperative action, the state commission decided to place at the disposal of the federal body the complete record in the case including the elaborate traffic studies prepared by its engineering department. This, the commission points out, is in accordance with the terms of the Transportation Act providing for cooperation between the federal and state commissions and will, it is believed, obviate duplication of preliminary work and hasten final decision.

New Idaho Power Plant Is Put in Operation at Mine

The new power plant of the Mascot Consolidated Mines Corporation, near Hailey, Idaho, has just been placed in operation. The plant includes a 250-hp. semi-Diesel oil-burning equipment which supplies power for the air drills, the machine shop and blower, as well as the modern electric lighting plant.

The Mascot company is arranging for the construction of a small testing mill, to be installed in February or March, preliminary to the building of a large mill that will care for the immense tonnage of ore now proved in the mine.

Equipment for First Oak Grove Unit Is Ordered

Portland Railway Light & Power Company Places Large Machinery Contract with General Electric Company

Orders were recently placed with the General Electric Company by the Portland Railway Light & Power Company for the electrical equipment for the first unit of the Oak Grove development on the Clackamas River, 57 miles from Portland. The orders covered one large water-wheel driven generator, with exciters, switchboard, three single-phase transmission transformers, high tension oil circuit oil breakers, etc. The ultimate capacity of the Oak Grove plant is three units of the size just ordered.

The generator will have the following rating: 30,000 kva. at 85 per cent power factor, 514 r.p.m., 11,000 volts, 3-phase, 60-cycle, vertical shaft, revolving field with direct connected 250-volt exciter mounted above the generator. All six generator terminals are to be brought out of the frame to permit the use of differentially connected overload relays. A vertical thrust bearing will be provided capable of carrying 100,000 lb. plus the weight of the generator rotor. Connection will be made to the 35,000-hp. Pelton reaction turbine by means of a solid flanged coupling.

In addition to the direct connected exciter, which will have capacity sufficient to excite one generator, a 200-kw. motor driven exciter, taking current from a special 3-phase, 11,000-2,300-volt transformer, is also provided. This motor driven exciter will be of sufficient capacity to furnish excitation for two 30,000-kva. alternators.

The order includes a 90-in. black marine finished switchboard with horizontal edgewise instruments, automatic voltage regulator, temperature indicator, switch controls, etc. Ample space will be provided for future installations.

The main transformers will be used to step up the generator voltage for transmitting to Portland. The three units are to be rated as follows: 10,000 kva., water cooled, outdoor type, 60-cycle, single-phase with 11,000-volt low tension and 66,000-volt high tension windings. Three 5 per cent full capacity taps are to be provided in the high tension windings. It is planned to operate the transformers delta connected until the second Oak Grove unit is installed, at which time the transformers will be Y connected on the high side, making the transmission voltage approximately 115,000.

Each transformer will be equipped with oil conservator, copper cooling coils and the usual various thermometers, alarms, etc. Each unit will weigh complete when filled with oil 63,000 lb.

Commodity Prices Compared with Gas and Electric Rates

A chart which graphically presents the relation of the gas and electric rates to commodity prices and the cost of oil in California, has recently been prepared for the annual report of the Railroad Commission of the State of California by the Gas and Electric Division of the commission. The chart includes the years 1914-1922.

In its report the commission states that there has been a downward trend in the cost of several important classes of public utility service in the past fiscal year ended June 30, and that a corresponding reduction concurrently has been reflected by it in public utility rates. Regulation, the commission adds, has demonstrated its flexibility and responsiveness to general economic conditions.

Referring specifically to electric rates, the report points out that the maximum increase over 1914 levels was 35 per cent, and the present excess is approximately 16 per cent, while commodity prices soared to 173 per cent over normal at the 1920 peak and are still between 60 and 70 per cent above pre-war. Gas rates showed a maximum increase of 27 per cent, which lasted about two months. Average gas rates are shown to be near normal.

Two power companies received particular attention from the investigating committee. These were the Pacific Gas & Electric Company and the Southern California Edison Company. In the case of the first company rates went to 134 per cent for one year, taking 1914 rates as 100 per cent, and the Southern California Edison Company rates figured on the same basis went as high as 143 per cent for a short period. Both of these rates were lowered by the commission within a year. The Pacific Gas & Electric Company rates are now 23 per cent above those in 1914 while the the rates of the Edison Company are 16 per cent over the 1914 schedule.

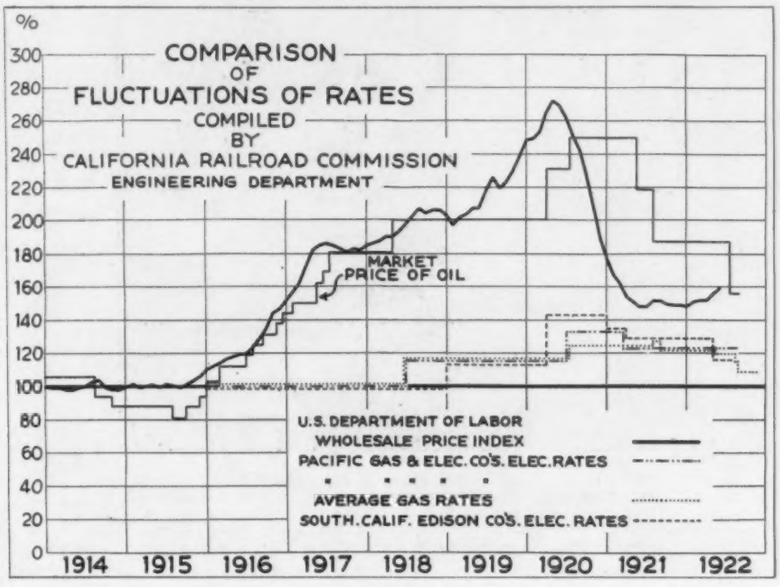


Chart showing comparison of commodity prices with gas and electric rates in California between 1914 and 1922, inclusive

Will Erect Modern Wood Treating Plant in Oregon Town

A modern, up-to-date wood treating plant that will have an initial capacity of one carload per day is to be erected immediately in Springfield, Ore. The Carbolinum Wood Products Company of Portland is the concern and has purchased a site for the new plant on the Southern Pacific Tracks.

George P. Hitchcock, Eugene lumber dealer, is general manager of the concern and will maintain offices in the First National Bank Building in Eugene. The concern has owned and operated a similar plant at Alder, but this will be dismantled and brought to Springfield. Much new equipment will be installed.

Hood River Plant Will Be Ready to Operate by March

The Pacific Power & Light Company is rapidly bringing to completion its $2,500,000 power plant on Hood River, in Oregon. The new power house will be outside the city limits, just below the grade of the new Mount Hood Loop highway. The dam is located three miles farther up the river and the 100-in. pipe line is being laid between the intake and the power house.

The new development will not only serve the rapidly growing communities around Hood River and The Dalles, Ore., and White Salmon, Wash., but the line will be tied with the Northwestern Electric Company's plant at White Salmon River, and energy will be sold from the local plant in Portland. The new plant will be ready for operation next March.

The Geysers Development Company has recently filed articles of incorporation with the county clerk of Sonoma County, Calif. This company plans to develop power from the geysers of Sonoma County. The company is organized for the purposes of mining for minerals, making gas, fuel, chemicals, electricity, and oils, and for maintaining hotels.

Small electric furnaces are being tested in the smelter camps in Colorado at the present time. According to men of the industry the success of the small or fifty-ton unit smelter depends upon the perfection of these furnaces. These small unit plants are designed for smelting ores of only one class.

New Washington Rate Schedule Has Been Filed

Active Room Principle Is Basis of New Electric Rates Presented for Ratification to Public Works Officials

A system of schedules entirely new in the State of Washington, but which promises to bring about a reduction in domestic lighting and cooking rates for electricity of from 20 to 30 per cent for about 95 per cent of the consumers, has been filed with the Department of Public Works by the Pacific Power & Light Company, which serves practically all of the communities in southeastern and central Washington.

The schedule is made up on a minimum charge basis, combined with a calculation of the number of active rooms a house contains. Active rooms are those customarily used, such as living room, dining room, kitchen and bedrooms. Halls, bathrooms, lavatories and porches, garages, barns and other such rooms are not considered active rooms, except that when a sleeping room is connected with the barn or garage, the two combined are listed as one active room.

Four different sets of schedules are contained in the tariff, providing lowest rates for the larger cities, and slightly higher rates as density of population decreases. All schedules are subject to 10 per cent discount. For Blalock, College Place, Yakima and Walla Walla, the new rates prescribed are 12.22 cents per kw-hr. for the first 9 kw-hr., plus 2 kw-hr. per active room, with a minimum of four active rooms. All in excess of this minimum, 6.66 cents per kw-hr. Minimums, inside corporate limits, $1 per month; outside, $1.50. The present rate is 12.22 cents for the first 30 kw-hr., and 10 cents per kw-hr. after that.

Class one towns are to have a new rate of 16.11 cents per kw-hr. for 7 hours plus 2 kw-hr. for each active room, minimum 4 active rooms; all in excess at 6.66 cents per kw-hr. The present rate is 16.11 cents for the first 30 kw-hr., and 10.55 cents per kw-hr. in excess of 30. Monthly minimum inside corporate limits, $1, outside, $1.50.

Class two towns will have the same rates as class one towns, except that the monthly minimum will be $1.50.

The towns of Pomeroy and Toppenish receive still different rates. The new rates are 15.55 cents per kw-hr. for the first 7 kw-hr., plus 2 kw-hr. for each active room, minimum of four active rooms; all in excess at 6.66 cents per kw-hr. The old rates are 15.55 cents per kw-hr. for the first 30 kw-hr., and 10 cents per kw-hr. over that.

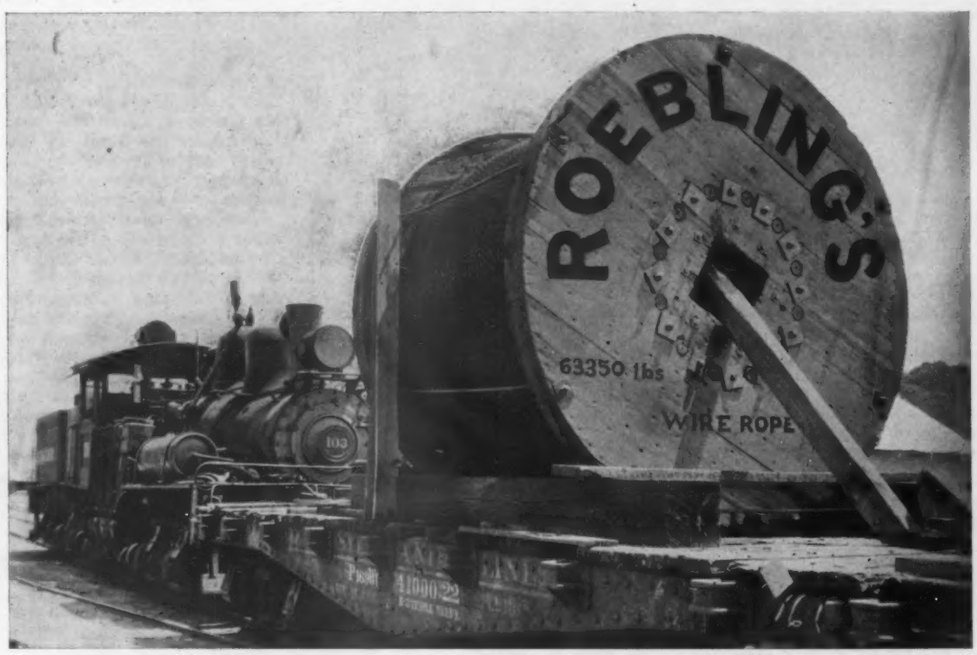
In addition to these rates, the company prescribes a combination lighting and cooking schedule for each class of town, and while this combined rate does not show as much reduction as the lighting rates, yet the whole schedule is worked out on the lower rates for greater consumption basis. In computing active rooms, as the rate basis, the schedules provide that each counted room up to and including six shall be considered as an active room. Each counted room in excess of six will be counted as one-half an active room, except in houses served under one contract and occupied by more than one independent family, in which case each counted room shall be considered as an active room.

The Department of Public Works has not yet approved the new schedules which will become effective Jan. 10. Information will be sought from other statse, where the active room basis of computing rates is in effect.

According to reports from Twin Falls, Idaho, Jan. 16, has been finally set as the date on which residents of irrigation projects extending along the Snake River from St. Anthony to Twin Falls will vote on the creation of the proposed Snake River irrigation district.

The contemplated new district proposes to issue its bonds in payment to the federal reclamation service for obligations of the several canal companies included in the district.

The Arapahoe Light & Power Company located at Littleton, Colo., a suburb of Denver, has completed arrangements whereby it will provide power for a new machinery plant being constructed by the Stearns-Rogers Manufacturing Company near the Denver city limits. The contract calls for a supply of 1,500 hp.



During the construction work on the Big Creek No. 3 power house of the Southern California Edison Company, wire cable, having an approximate breaking strength of 180,000 lb., was needed for cars on the incline railroad. An order was placed with John A. Roebling's Sons Company of Trenton, N. J., and the reel pictured above was sent to the power company. The reel contained 15,000 ft. of plow steel wire rope which was in one piece, 1½ in. in diameter and composed of six strands, 19 wires to the strand, with an independent wire rope center. The net weight of the wire was 59,001 lb.

Commission Orders Consumers to Pay Standard Rates

Standard rates must apply to all electric railroads in the State of Utah, according to a decision recently handed down by the Public Utilities Commission of the state. A total of seventy-six contracts have been investigated by the commission and the ruling just handed down deals particularly with the Bamberger Electric Railroad Company.

This company had a special contract with the Utah Power & Light Company which stipulated that it should receive electric power at half rate. This special contract was made when the railroad company sold its filings on certain water rights on the Weber River, to the Utah Power & Light Company. The special rate was to hold for twenty-five years and now has fifteen years to run.

Under the ruling of the commission, the railroad company is to receive 5 per cent of the total cost of the plant erected on the Weber River site as a compensation for instigating the development. The actual purchase price of the site was $525,000. Figuring the compensation as 5 per cent of this and adding filing fees and surveying costs, the commission has decided that the railroad is entitled to $17,000 from the Utah Power & Light Company. Of this sum, $2,000 is to be paid in cash and the balance is to be amortized over a period of fifteen years. During this period $1,000 will be deducted each year from the railroad's payment to the power company.

Annual Kiddies' Day Is Held by San Francisco League

On Dec. 18, the San Francisco Electrical Development League held its annual Christmas Kiddies' Day Party. Ninety orphan children were delighted with the actions of Santa Claus and the clowns who presented balloons and Christmas gifts to them.

E. O. Shreve, San Francisco manager of the General Electric Company, acted as Kris Kringle and when bedecked with all of the appropriate beard and costume made a correct impersonation of the Christmas visitor. Presents for the children were purchased with funds collected as fines during the year.

About 500 members of the electrical industry in San Francisco were present at the meeting. Because of the large crowd it was necessary to use both the ball room and the concert room of the Palace Hotel to accomodate the luncheon guests.

Company Plans to Sell Holdings to Local Competitor

Denied authority by the Railroad Commission to extend its lines to additional territory, the Del Monte Light & Power Company has received from the California Railroad Commission permission to sell its holdings to the Coast Valleys Gas & Electric Company, which operates in territory contiguous to that served by the Del Monte company. The consideration is given as $50,000, of of which $42,200 will be paid in bonds of the Coast Valleys company.

In a previous order issued by the commission in connection with the proposed service extension the commission stated:

> The two companies operating as separate companies cannot possibly do as well as though the one company were supplying the entire territory, where these lines practically surround this particular company. Those points are outside the consideration of the company itself in its effort to build up and make money. They are the public considerations that confront this commission.

Murray City Corporation has applied to the state engineer of Utah for the use of 15 sec.-ft. of water from Little Cottonwood Creek, in Salt Lake County, Utah, to increase the output of the municipal plant which now serves Murray and vicinity. The new power plant site proposed is a short distance southeast of Sandy, Utah. Water will be brought to it from a point about 500 ft. upstream, a short distance in a flume, and the remainder of the way in a 30-in. pipe line. It will be turned over two 5-ft. Pelton wheels, under a head of 250 ft., developing an estimated 250 hp.

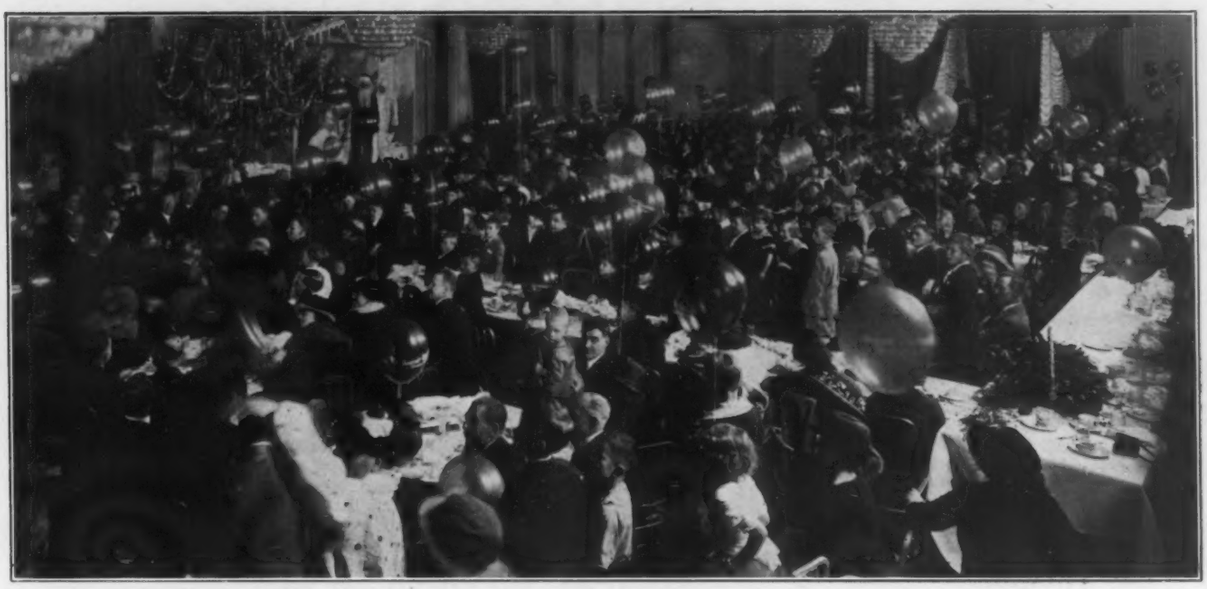
Utah Power Company Attacks Public Utilities Law

Declaring that the statute, which gives the Public Utilities Commission of the State of Utah power to determine the amount of reparation which a public utility shall pay a patron, whom it has overcharged, violates the fourteenth amendment to the Federal Constitution and at least two sections of the state constitution, the Utah Power & Light Company is violently attacking that section of the public utilities law which provides for this.

The power company claims that this statute gives a judicial function to a legislative or executive body and that it gives this body the right to confiscate private property without due process of law. According to the power company's claim, the amount of the reparation should be determined in the courts, thus permitting the utility an opportunity to fairly combat the suit for reparation.

The motion, which was placed before the commission, was brought about by the claim of the Utah-Idaho Central Railroad Company for reparation for over-payment to the power company during a period of over a year, by reason of a rate determined upon by the commission. Later the commission reduced the rate, making it retroactive and now the railroad company seeks to secure an indemnity for the overpayment.

The Chamber of Commerce of Fresno, Calif., is advocating the installation of a new system of electroliers for Commercial Park, in the valley city. This park is one of the most beautiful in the San Joaquin Valley and it is the purpose of the body to further enhance the site by installing a system of electroliers similar to those used in the down town district. The standards in use at present are very expensive and highly inadequate, according to the manager of the Chamber of Commerce. The Southern Pacific Company has been asked to help pay for the new electroliers.



Santa Claus distributing presents to the ninety orphans at the annual Kiddies' Day Party of the San Francisco Electrical Development League.

Permit Sought for Utah Power Development Project

Development of 4,800 hp. of electrical energy on Big Cottonwood Creek is proposed under an application filed with the Utah state engineer by Clarence Snow of Salt Lake City.

The application seeks to divert 50 sec.-ft. of water from the Big Cottonwood Creek at a point in section 14 of township 2 south, range 2 east. The diverting works are to consist of a concrete diversion dam and headgate and pipe line. It is proposed to convert this water by means of a diversion ditch some 17,400 ft. to the power plant, where it will be used under a head of 1,140 ft. to operate a number of reaction-type turbines. The water is to be returned to the river channel at a point about six miles below the point where taken out.

Major Blauvet Named Colorado State Highway Engineer

After passing the civil service commission examination at the head of the list, Major L. D. Blauvet has been appointed state highway engineer for Colorado by Governor Shoup. Major Blauvet has been holding the position temporarily, as at the time of the adoption of the new Colorado highway law no one had passed the required examinations. His recent passing of the examinations makes him fully qualified for the position.

At the present time Major Blauvet and the seven members of the state highway commission are working on the 1923 budget of the highway commission. Indications are that the new budget will be close to $9,000,000.

Power Company to Increase Its Generating Capacity

The Coast Power Company of Tillamook, Ore., which serves the city and vicinity, has closed down its steam plant for a period of three months, pending the completion of a new and larger plant located on Hoqwarton Slough. During the construction period, energy will be supplied the power company by the Whitney Lumber Company of Garibaldi, Ore.

The capacity of the present plant of the Coast Power Company was 800 kw. This equipment will be moved to the new location and another turbo-generator of 1,500 kw. added, together with boilers and auxiliaries. Arrangements have been made with the Whitney Company to purchase their excess power for distribution throughout the country.

Service to Be Given California Towns by Power Line

The Midland Counties Public Service Corporation of San Luis Obispo, Calif., has recently completed the construction of a 30-mile high tension transmission line at a cost of $100,000. The new line will serve the towns of Morro, Cayucas and Cambria, and a number of smaller adjacent communities.

The line connects with the 60,000-volt line of the company at a point near the San Luis Obispo Polytechnic School and from this point to Cayucas, a distance of 20 miles, is for 60,000-volt operation. From Cayucas to Cambria the line is designed for 10,000-volt current. The entire new system will be operated at 10,000 volts as the load does not justify higher voltage at present.

Contracts have been signed for about forty pumping plants, to be installed next spring, ranging in capacity from 15 to 50 hp. One hundred and forty meters for lights and power have been set since the completion of the line and the company expects that the number will be more than doubled during the year.

Portland to Have New Cooperage Plant in Near Future

A new cooperage plant to be known as the Pacific Hoop Company, to utilize Oregon woods, is to be established immediately on a ten-acre tract in the Peninsula district of Portland, Ore. The site purchased already has on it a large corrugated iron building, which will be used, and other buildings will be added to house the wood working machinery, a sawmill of 20,000-ft. daily capacity and the dry kilns.

The new company is an Oregon corporation capitalized at $50,000. The officers are G. P. Clerin, president; J. E. Wright, vice-president, and V. J. Marchand, secretary, all of whom are experienced in the cooperage business.

New Mexico Town Will Have New Generating Plant Soon

Artesia, N. M., is to have $50,000 worth of new electrical equipment installed in the power plant of the city. A new steam generating plant will be installed on the site of the old Pecos Valley Gas & Electric Company's plant.

The old plant has been purchased by the city and has been operated temporarily by the city. Under conditions existing at present the power plant can generate electricity for lighting purposes only. When the new equipment is installed there will be a supply of power sufficient to operate many commercial motors in the town.

Application for a license by the Home Builder Mining and Development Company has been filed with the Federal Power Commission for the development of a power project in the Coeur d'Alene National Forest, Kootenai County, Idaho. This involves the construction of a diversion dam 50 ft. and another 40 ft. high in Phantom and Blue Grouse Creeks, with two miles of pipe line to the power house on Wolfe Lodge Creek, developing 250 hp. for mining purposes.

Construction of the power line from Sheridan, Mont., to Dillon, Mont., will be started in the late spring months. This transmission line will bring the power of the Montana Power Company to the Union Electric Company at Dillon. Actual construction will probably take a greater part of the summer

Cities near Anchorage, Alaska, will be supplied with electricity from a power plant capable of generating 3,000 hp., according to advices received by the Seattle Chamber of Commerce from J. C. Dort, assistant engineer of the forest service. It is thought that three generators will carry power over a 55-mile transmission cable.

Books and Bulletins

ELEMENTS OF APPLIED ELECTRICITY

By H. H. BLISS, Director of Vocational Education, Riverside, Calif. 6 by 9 in. 403 pages. 102 diagrams and illustrations. $2. Published by Journal of Electricity and Western Industry, San Francisco.

The best investment of spare time is in study leading to self-improvement and to advancement in one's vocation. Electrical workers enjoy exceptional opportunies of this kind. This book, which first appeared in the Journal of Electricity and Western Industry in the form of a study course, has been written for use as a text book for those men desirous of having an understanding of the fundamentals of electricity and electrical machinery. The author has been thorough in his treatment of the subject, yet in no place is his language so technical that it cannot be understood by one almost totally unfamiliar with the subject of electricity. Similarly, the mathematical solutions of the problems offered are most simple and a knowledge of common arithmetic is sufficient for solving any of the problems which are used to supplement the text and to give the student a more thorough understanding of the theories discussed. The text goes into detail concerning circuit and machine characteristics, efficiencies, applications of principles and electrical calculations.

PENDER HANDBOOK FOR ELECTRICAL ENGINEERS

By HAROLD PENDER, editor-in-chief, director electrical engineering department, University of Pennsylvania, and WILLIAM A. DEL MAR, associate editor-in-chief, Chief Engineer, Habirshaw Electric Cable Company. Second edition. 4½ by 7 in. 2,270 pages, flexible leather binding. Fully illustrated with charts, drawings, diagrams and tables. $6. John Wiley & Sons, Inc., New York.

This is a revision of the first edition of Pendar published in 1914. It has been completely revised and much new material added. Included in the new articles is one on the electric propulsion of ships and one on electric welding. Because of the considerable progress electrical science has made in the advancement of the electron theory and its application to engineering, full treatment has been given this subject. The work constitutes a valuable reference book for practicing engineers and students of engineering. In addition to the usual index, an enclycopedic arrangement of the material in the front of the book especially commends it for reference purposes. By following the topical list of articles no difficulty should attend its use for constructive study. To make the book adaptable for the use of engineering students in the universities this list has been arranged in the order usually followed in the course of class studies. The authors have taken special care to make each article a readable compendium on its subject rather than merely a series of disconnected paragraphs containing miscellaneous data, a too common fault in hand books.

W. C. H.

Meetings

Sacramento Electrical Men Form New Cooperative League

At a banquet given in the Hotel Land at Sacramento, Calif., on Dec. 13, almost a hundred members of the electrical industry of Sacramento and vicinity met with a large delegation from the San Francisco Electrical Development League for the purpose of discussing the advisability of forming a permanent electrical club in the Sacramento district. J. C. Hobrecht acted as toastmaster of the meeting, introducing in turn E. O. Shreve, manager of the San Francisco office of the General Electric Company; R. A. Balzari, president of the San Francisco Electrical Development League; Don C. Ray, Pacific Gas & Electric Company; and Geo. B. Sanford, Great Western Power Company, who expressed sentiments in favor of the proposed organization.

After several speeches from the floor wherein all expressed sentiments in favor of an organization uniting the various electrical interests for mutual benefit, the following resolution was proposed by J. A. Woods:

"Whereas, There are, in Sacramento and surrounding territory, a considerable number of men engaged in the electrical industry in managerial, engineering, or other responsible capacity, and

"Whereas, An organization is deemed advisable for the purpose of drawing these men closer together for purposes social, educational and commercial, therefore be it

"Resolved, That an organization be formed, and for the speedy accomplishment of this object, be it

Further Resolved, That the chairman of this meeting appoint a committee of fifteen, which committee shall organize at an early date and shall appoint from its number such sub-committees as may be deemed necessary for the speedy conduct of business, and shall prepare a form of constitution and by-laws, a list of nominees for office, and such recommendations and reports as it may deem advisable for the organization of a permanent society and shall report its recommendations for action by this body at another meeting to be held in the near future."

The above resolution was voted upon by those assembled and adopted. J. C. Hobrecht, acting as chairman, appointed the following committee:

J. O. Tobey, chairman, P. G. & E. Co.
Jay A. Davis, G. W. P. Co., Sacramento.
Fred Bennett, Telegraph
E. H. Long, Telephone
H. A. Shearer, Telephone
A. P. Braughten, S. P. Co.
W. H. Evans, S. N. R.R.
G. M. Simonson, State of Calif.
L. J. Fletcher, Univ. of Calif. Davis Farm
Carl Lamus, Automotive Electrician
A. C. Scott, Retail Stores
R. B. Brewster, Radio
C. Prudhomme, Electrical Contractors
James A. Woods, Elect. Contr.-Dealers.

The appointment of this committee was followed by showing of a motion picture, "The Electrical Home," starring Buster Keaton.

J. O. Tobey, chairman of committee, called a meeting for Dec. 18, at which time Jay A. Davis, having acted as secretary to the original committee, was continued in that capacity to the committee of fifteen and also temporarily elected treasurer. The general plan of the work having been made known at the dinner meeting, Mr. Tobey appointed the following committees for purposes expressed in the resolution adopted:

Name Committee (This committee to receive suggestions for a suitable name for the organization and make report to full committee):

F. A. Bennett, West. Union Tel. Co., Sacramento, chairman.
W. H. Evans, S. N. R.R., Sacramento.
C. Prudhomme, Elect. Contractor, Sacramento.

Committee on By-laws (This committee to frame a complete set of by-laws patterned, insofar as practicable, after those of similar and successful organizations):

James A. Woods, Cal. Mech. & Elect. Eng. Co., Sacramento, chairman.
L. J. Fletcher, Univ. of Calif., Davis Farm.
H. A. Shearer, T. P. T. & T. Co., Sacramento.

Committee on Nomination (This committee to select from available members a set of nominees for the principal offices—to be selected in duplicate, if possible and wherever practicable, in triplicate):

G. M. Simonson, Dept. of Pub. Wks., State of Calif., chairman.
C. W. Beaton, City Electrician, City of Sacramento.
Jay A. Davis, G. W. P. Co., Sacramento.
R. B. Brewster, J. C. Hobrecht, Sacramento.
Carl Lamus, Automotive Electricians, Sacramento.

Committee on Arrangements (This committee to make all necessary arrangements for next general meeting to perfect the organization):

C. Prudhomme, Electrical Contractor, Sacramento, chairman.
Ben Brown, T. P. T. & T. Co., Sacramento.
J. J. Scott, John Breuner Co., Sacramento.

Following is a list of names of each attendant at the dinner of Dec. 13, who indicated his intention of becoming a member of the new organization:

C. L. Anderson, Anderson Miller Elect. Co., Sacramento.
R. A. Balzari, West. Elec. & Mfg. Co., San Francisco.
C. W. Beaton, City Electrician, Sacramento.
A. P. Braughton, Elect. Dept., S. P. Co., Sacramento.
Ben Brown, T. P. T. & T. Co., Sacramento.
L. D. Burlingame, P. G. & E. Co., Sacramento.
R. L. Bushey, G. W. P. Co., Sacramento.
W. E. Camp, Roberts Eng. & Const. Co., Sacramento and Marysville.
M. P. Canon, Latourette Fical Co., Sacramento.
C. H. Carter, C. H. Carter Co., Sacramento.
Chas. H. Claytor, P. G. & E. Co., Sacramento.
E. Conger, Conger's Elect. Shop, Woodland.
Edward T. Cook, Sterling Elect. Co., Sacramento.
J. W. Coons, P. G. & E. Co., Woodland.
H. M. Cooper, P. G. & E. Co., Auburn.
W. Rad Coover, P. G. & E. Co., Sacramento
J. W. Crabbe, P. G. & E. Co., Auburn.
C. B. Daniel, P. G. & E. Co., Sacramento.
W. J. Delehanty, G. E. Company, Sacramento.
Jay A. Davis, G. W. P. Co., Sacramento.
R. E. Dryer, West. Elec. Co., Sacramento.
W. H. Evans, S. N. R.R., Sacramento.
L. J. Fletcher, Univ. of Calif., Davis Farm, Davis.
E. W. Florence, P. G. & E. Co., Sacramento.
Geo. C. Foss, Electrical Contractor, Sacramento.
J. G. Frye, P. G. & E. Co., Sacramento.
Jason L. Frye, P. G. E. & Co., Sacramento.
O. S. Furt, Dealer, Davis.
S. E. Gamble, Westinghouse E. & Mfg. Co., Sacramento.
T. J. Goldbeck, Electrical Supply Co., Sacramento.
D. L. Hickey, P. G. & E. Co., Sacramento.
Earl M. Hart, P. G. & E. Co., Sacramento.
J. C. Hobrecht, J. C. Hobrecht Co., Sacramento.
P. J. Hobrecht, J. C. Hobrecht Co., Sacramento.
R. Jones, C. Prudhomme, Elect. Contr., Sacramento.
James R. Kelly, G. W. P. Co., Brighton.
R. E. Knight, G. W. P. Co., Brighton.
W. E. LaBare, T. P. T. & T. Co., Sacramento.
J. Fred LaPlace, Thos. Day Co., Sacramento.
Geo. W. Lee, W. S. G. & E. Co., Florin.
H. B. Matthews, P. G. & E. Co., Sacramento.
D. H. McCullough, Contractor-Dealer, Sacramento.
Ben D. Moses, Univ. of Calif., Davis Farm, Davis.
J. O. Murphy, Contractor-Dealer, North Sacramento.
D. R. Murray, G. W. P. Co., Sacramento.
A. H. Nicoll, West. Electric Co., San Francisco.
Leo. J. O'Brien, P. G. & E. Co., Sacramento.
Clifford Prudhomme, Elect. Contractor, Sacramento.
Jas. S. Remick, Jas. S. Remick Co., Sacramento.
W. H. Rockingham, Dept. of Pub. Wks., State of Calif.
A. E. Rowe, Garnett Young & Co., San Francisco.
C. A. Rylander, Elect. Ry. & Mfg. Supply Co., San Francisco.
Geo. B. Sanford, G. W. P. Co., Sacramento.
V. H. Savoie, Elect. Machinery Co., Sacramento.
Tom Scott, Sr., Scott, Lyman & Stack, Sacramento.
C. E. Sedgwick, P. G. & E. Co., Dixon.
G. M. Simonson, Dept. of Pub. Wks., State of Calif.
C. V. Schneider, Elect. Supply Co., Sacramento.
H. A. Shearer, T. P. T. & T. Co., Sacramento.
W. D. Tomas, Electric Appliance Co., San Francisco.
J. O. Tobey, P. G. & E. Co., Sacramento.
L. T. Weber, City of Sacramento (Electrical Dept.).
W. A. Weigt, Sterling Elect. Co., Sacramento.
H. E. Willis, S. F. S. R.R., Sacramento.
F. W. Nieuman, White & Nieuman, Davis.
James A. Woods, Cal. Mech. & Elect. Engr. Co., Sacramento.

In attendance at the meeting of Dec. 13, from the San Francisco Electrical Development League, were the following:

M. W. Scanlon, A. H. Nicoll, V. W. Hartley, W. F. Price, A. E. Rowe, S. P. Russell, L. F. Leurey, R. A. Balzari, E. O. Shreve, G. H. Curtiss, J. E. Bridges, W. L. Winter, R. S. Prussia, S. E. Gamble, D. C. Ray, R. F. McDonald, N. S. Gallison, W. W. Hicks, A. J. Kercher, Paul White, A. Strauch, R. B. Peterson, W. D. Thomas.

COMING EVENTS

National Council of Lighting Fixture Manufacturers—

Annual Convention—Cleveland, Ohio
Jan. 15-20, 1923

Lighting Fixture Dealers Society of America—

Annual Convention—Cleveland, Ohio
Jan. 15-20, 1923

American Institute of Electrical Engineers—

Midwinter Convention—New York, N. Y.
Feb. 14-16, 1923

Colorado River Development Is Discussed by Engineer

Captain Clarence S. Jarvis of the United States army engineering corps was the speaker at the weekly luncheon of the Rotary Club of Provo, Utah, on Dec. 8.

Captain Jarvis spoke on the engineering features of the Colorado River project. He related, in brief, the story of the signing of the pact that has now gone before the legislative bodies of the states and the nation, providing for the diversion of the flow of the river at Lee's ferry.

Personals

Dr. Robert A. Millikan of Pasadena, Calif., has been awarded the Edison Medal for 1922 by the American Institute of Electrical Engineers for "his experimental work in electrical science." The Edison Medal was founded by the Edison Medal Association, composed of associates and friends of Thomas A. Edison, and is awarded annually by a committee consisting of twenty-four

DR. ROBERT A. MILLIKAN

members of the American Institute of Electrical Engineers for "meritorious achievement in electrical science, electrical engineering, or the electrical arts." Dr. Millikan was born in Morrison, Ill., in 1868, is a graduate of Oberlin, class of 1891, and was granted a Ph.D. from Columbia in 1895. He also holds degrees from Berlin and Gottingen, Northwestern, Pennsylvania and Amherst. He took up the teaching of physics at Oberlin in 1891 and from there went to the University of Chicago where he became assistant professor of physics in 1901, associate professor in 1907 and professor in 1910. In 1921 he became director of the Norman Bridge Laboratory of Physics at the California Institute of Technology where he is also Chairman of the Administrative Council. Dr. Millikan is the author of numerous books on physics and has contributed largely to the technical press on the same subject. He is a member of the National Academy of Sciences, American Philosophical Society, American Physical Society, the American Institute of Electrical Engineers; also the Cosmos, Quadrangle, University and Valley Hunt clubs.

Jesse S. Wathey, superintendent of the Butte Electric Railway Company, Butte, Mont., has retired and in the future will make California his home. Mr. Wathey has been connected with the company for the past 33 years. His post will be taken by **E. J. Nash,** former electrical superintendent of the company.

Dr. Henry Landes, professor of geology and mineralogy and deal of the college of science at the University of Washington, recently reviewed the results of a survey which he conducted on the geological formations of the Pacific Northwest, before the Seattle section of the American Institute of Electrical Engineers. He discussed the survey from the standpoint of the influence of geological formation on the hydroelectric possibilities of that section of the country.

Franklin T. Griffith, president of the Portland Railway, Light & Power Company, has returned to Portland after an eastern business trip. Mr. Griffith, who is a vice-president of the National Electric Light Association, attended the meeting of the executive committee of that organization while in New York.

J. C. Thompson, formerly assistant treasurer of The California Oregon Power Company, has been made assistant general agent with headquarters in Medford.

Dr. Edgar A. Loew, associate professor of electrical engineering at the University of Washington, Seattle, was the chief speaker at a recent meeting of the Seattle section of the American Institute of Electrical Engineers. Professor Loew discussed the results of exhaustive studies on electric heating which have just been completed by the Engineering Experiment Station of the university.

F. W. Buck of the Hoover Sweeper Company, Indianapolis, recently spent several days in San Francisco. Mr. Buck is investigating market conditions in the various western business centers.

E. D. King, of the Washington Coast Utilities Company of Arlington, Wash., is a recent San Francisco visitor.

V. L. Board has been named general superintendent of the Denver Gas & Electric Light Company. He formerly served as assistant to the general manager, **C. N .Stannard,** and his new office is the one formerly held by **T. O. Kennedy,** now general manager of the Ohio Public Service Company, with headquarters in Cleveland.

Chas. H. Lee, consulting engineer of San Francisco, formerly chairman of the California Water Commission, has been appointed by the Board of Regents of the University of California as lecturer in civil engineering during the coming year and will conduct the course in Water Supply Engineering ordinarily given by Professor Chas. Gilman Hyde, professor of Sanitary Engineering. Professor Hyde will be absent from the university during the coming half of 1923 on sabbatical leave. Mr. Lee will carry on the work at the university in addition to his regular consulting practice.

John R. Freeman, president of the American Society of Civil Engineers, is again in his New York headquarters after visiting the Pit River development of the Pacific Gas & Electric Company, the Caribou plant of the Great Western Power Company, the Hetch Hetchy, Lake Eleanor dam, the experimental research laboratories of Dr. Milliken and Dr. Noyes at Pasadena, the Imperial Valley protection work from the incursions of the Colorado River at Yuma, and other interesting western developments.

D. C. McClure, electrical superintendent of the Denver Gas & Electric Light Company, attended the Yale-Harvard football game in New Haven, Conn., Nov. 25, while on a business trip to New York.

H. M. Southgate, manager of the Washington, D. C., office of the Westinghouse Electric & Manufacturing Company, is spending several weeks in Los Angeles.

Major John C. Gothwals of Juneau, Alaska, chief engineer of the Alaskan Railroad Commission, was recently the guest and speaker at a luncheon of the A.A.E., Seattle branch.

Milton Henoch has just been assigned to the Los Angeles office of the Westinghouse Electric & Manufacturing Company, as range and heating appliance specialist. Mr. Henoch has been with the Westinghouse company for the past fourteen years and prior to his recent assignment, was central sales representative of the Mansfield Works of that company.

Lee M. Oakford, of the Graham-Reynolds Electric Company, Los Angeles, has just recently been appointed manager of the lamp department of that company. Mr. Oakford has been in the sales department of the Graham-Reynolds Electric Company for the past year and a half, and prior to that time, was with the sales department of the Westinghouse Lamp Company's Los Angeles office.

B. E. Rowley, sales manager, Salt Lake district, Edison Electric Appliance Company, attended the Pacific Coast Jobbers' Association convention at Coronado.

William E. Sweet, well known to the electrical industry in Colorado, was recently elected governor of that state on the Democratic ticket in one of the closest campaigns ever waged in that section. Although nominally a banker and financier he has prominent connections in the electrical industry in Colorado and surrounding states. He is vice-president of The Albert Sechrist Manufacturing Company, manufacturers of lighting fixtures and electric cookers, and is financially interested in an electric utility in Nebraska and has extensive holdings in Colorado industrial organizations. One of the prominent

WILLIAM E. SWEET

planks in the platform of the governor-elect was one favoring municipal ownership of public utilities. It is believed that this constituted one of the reasons for the defeat of certain measures referred to the voters at the recent election giving the state utilities commission power of control over all public utilities in "home rule" cities, excepting those municipally owned.

Robert Sibley, Pacific Coast editorial director of the McGraw-Hill electrical papers, Electrical World, Electrical Merchandising and Journal of Electricity and Western Industry, has resigned to become executive manager of the University of California Alumni Association, remaining only as a consulting editor for these papers. The University of California, with its ten thousand regularly enrolled students at Berkeley, its thirty-five hundred students at the Southern Branch in Los Angeles, and its annual budget expenditure of eight million dollars, has become an important force in the development of the West. Mr. Sibley's work will be largely among the twenty-five thousand alumni and former students of the University. An effort will be made to bring about a better understanding of the University among business and professional men, and to promote a healthier relationship between the great educational institutions of the West and the factors concerned with its upbuilding. The enthusiasm and substantial financial support that has been pledged to this new and enlarged activity by hundreds of men and women throughout the West augur success from the start for this unique undertaking, perhaps the first of its kind among American universities. Mr. Sibley is a graduate in electrical engineering from the University of California with the class of 1903. He was for four years professor of electrical engineering at the University of Montana, for four years professor of mechanical engineering at the University of California, and has had extensive experience in hydroelectric practice. He became editor of the Journal of Electricity and Western Industry in 1916 and held that position until July, 1922, when he was made editorial director of all of the McGraw-Hill electrical papers for the Pacific Coast. Mr. Sibley is vice-president of the American Institute of Electrical Engineers and of the American Society of Mechanical Engineers, and last May in recognition of his work in hydroelectric and steam-electric advance he was granted the Doctorate Degree of Electrical Engineer by the University of California. He is co-author with C. H. Delany of "Elements of Fuel Oil and Steam Engineering."

ROBERT SIBLEY

W. D. Barkhuff, Seattle civil engineer, has been appointed superintendent of streets and sewers, to replace **Colonel George M. Rice,** who resigned before he had taken over the work. Mr. Barkhuff served as district engineer in the city engineer's office from 1908 to 1911, since which time he has been engaged in contracting work in Seattle.

Dr. Elwood Mead, chief of the land settlement division of the California State Department of Public Works, has announced that he will not be a candidate for reappointment to that post next year. Dr. Mead, who is a pioneer in land settlement work, having organized the present Durham colony in California six years ago, is also professor of rural institutions at the University of California.

W. A. Ramsay, general manager of Catton Neill & Company, Ltd., consulting and contracting sugar mill engineers of Honolulu, Hawaii, was a recent San Francisco visitor. Mr. Ramsay is making an intensive study of the industrial conditions of certain sections of the United States and will return to the Hawaiian Islands some time in the middle of January. Men of the West will recall that John Hood, formerly of the General Electric Company San Francisco office, is now in the employ of Mr. Ramsay in Honolulu.

Harry L. Harper, manager Los Angeles office, Western Electric Company, recently spent ten days in Portland and northern points where he attended a conference of Western Electric Company managers.

C. D. LaMoree, of the firm of Clapp & LaMoree, has just returned to Los Angeles from a very extended trip East where he visited the numerous factories which his firm represents on the Pacific Coast. Mr. LaMoree visited New York, Chicago, Valparaiso, Ind., Providence, R. I., and Racine, Wis.

Dr. Lloyd N. Robinson, recently chief electrical engineer for the Merced Irrigation District at Merced, Calif., is now electrical engineer for Stone & Webster, Inc., at Seattle, Wash.

George E. Quinan, chief electrical engineer, Puget Sound Power & Light Company, is deserving of much of the credit for the annuity idea which has been worked out for the extension of rural service lines in the State of Washington. The Department of Public Works of Washington, after a most exhaustive study of the rules and principles involved, has practically adopted them as a part of the regulatory law of that state.

H. W. Bliven, vice-president of Harvey Hubbell Company of Bridgeport, Conn., is a recent Pacific Coast visitor.

S. W. Bishop, executive manager of the Electrical Cooperative League in Denver, is a member of the committee staging the annual American Leagion show in that city.

A. J. Francis of the Fort Wayne Works of the General Electric Company, Fort Wayne, Ind., manager of fractional horsepower sales, is a recent San Francisco visitor.

J. R. Tomlinson of Portland, Ore., and **Clyde L. Chamblin** of San Francisco, are candidates for national executive committeemen from the Pacific Coast Division in the forthcoming elections of the National Association of Electragists.

H. J. Bilica, district line material manager of the Western Electric Company of San Francisco, is in Los Angeles going over the field with the local representatives.

Carl O. Martin of the Benjamin Electric Manufacturing Company, formerly located in Seattle, is now located in San Francisco as assistant to Miles F. Steel, Pacific Coast manager.

Manufacturer, Dealer and Jobber Activities

The Benjamin Electric Manufacturing Company, Chicago, has lately announced its line of plural socket devices. The group includes the No. 122 two-way plug, the No. 77 swivelling two-way plug, the No. 1080 tap plug and the No. 1006 adapter. The first described plug is a new edition of the original two-way plug manufactured by the company.

The Brascolite Company, of St. Louis, Mo., has recently appointed A. S. Knight of Seattle as its manufacturer's agent in that city. Mr. Knight has been given Montana, Washington, Oregon and northern California as his territory.

The Roller-Smith Company, New York City, has published Bulletin No. 20, which describes the Universal radio telephone receivers and loud speakers manufactured by the company. The loud speaker is a new product of the company.

The Western Electric Company of Denver has added to its local staff of experts, M. K. Leonard, who will specialize in farm light and power, telephone, battery and radio business of the company.

C. F. Bulotti Machinery Company has moved into its new store room at 67-71 Main Street, San Francisco. The new location is in the heart of the machine tool district and gives ample room for display as well as office facilities and immediate shop repair work.

The Simplex Wire & Cable Company, of Boston, has opened a branch office in New York City. Joseph G. Brobeck has been appointed manager of the New York branch.

The Hart & Hegeman Manufacturing Company, of Hartford, Conn., has recently placed on the market a new fuse plug which is known as the H & H fuse plug. This plug has a removable core thus permitting a renewal of the fuse by merely changing the core.

The Trinidad Gas & Electric Supply Company has opened the first radio broadcasting station in southern Colorado. Arrangements have been made by Harold Reed, general manager, to provide programs at least three nights a week which will be received in the various coal camps of the Colorado Fuel & Iron Company, through arrangements recently made for the installation of receiving sets and amplifiers in the company club houses. The first program was sent out Nov. 27.

The Dublier Condenser & Radio Corporation, of New York City, has recently put on the market a new line of Dublier Micadon condensers. Three separate styles of these devices are now marketed by the company in addition to its Dublier Variadon variable condenser.

The Westinghouse Electric & Manufacturing Company has recently extended its type F-11 line of oil circuit breakers by the addition of breakers of larger capacity, known as type F-22. The F-11 and the F-22 oil circuit breakers together comprise a line of moderate capacity, non-automatic and automatic, manually-operated breakers for indoor service. The type F-11 breakers are two and three-pole, single and double throw and are made in the panel-mounting and remote control, wall and pipe mounting forms for 200-amp., 4,500-volt service and 400-amp., 2,500-volt service. The type F-22 breakers are made in the panel mounting and remote control, wall and pipe mounting forms for 400- and 600-amp., 7,500-volt service, and 800-amp., 2,500-volt service, and are one, two, three and four pole, single throw, manually operated.

Betts & Betts Corporation, of New York City, has recently published its Radio Bulletin No. 180. This describes the Betts visible detector-amplifier, Betts head sets and the Betts loud speaker. The company's line of variometers, audio frequency transformers and vacuum tube sockets are also described.

The F. W. Wakefield Brass Co., Vermilion, Ohio, has recently issued a descriptive folder on their Red Spot commercial hangers. This folder describes their suspension and ceiling types of hangers and accessory units, also the method of packing.

E. E. Stettler of the **West Denver Electric Company** provided radio concerts for the crowds attending the Santa Fe Drive celebration in Denver recently. Loud speaking apparatus and amplifying equipment was provided by A. C. Cornell of the **Western Electric Company, Inc.**

George M. Woods, of American Falls, Idaho, has announced his intention of opening an electric shop in that city. Mr. Woods is an experienced electrician.

The O. C. White Company, of Worcester, Mass., has recently published its booklet on White adjustable electric light fixtures. The booklet contains illustrations and descriptions of all of the portable and mounted fixtures manufactured by the company. A new price list is included.

Additional representation for the Eden washing machine in Denver, Colo., has been given to **George A. Hunt** of that city and he has established headquarters at 505 Commonwealth Building, according to advertising recently appearing in the Denver papers.

C. Brandes, Inc., has recently produced a new method of displaying radio headphones. The company has prepared for distribution to dealers and jobbers bronze statuettes upon which headsets can be adjusted. The device has proved to be quite popular among retail radio merchants.

The P. A. Geier Company, Cleveland, Ohio, has announced a new, complete set of attachments for the Royal electric cleaner to replace the "long" and "short" sets of attachments previously sold.

The Commercial Switchboard Manufacturing Company, of Denver, Colo., has become a subscribing member to the Electrical Cooperative League in that city.

Frank Kohnstamm and **Frank Forshee**, manager and chief engineer respectively of the **Westinghouse Products Company**, of Mansfield, Ohio, toured the West shortly before the holidays in the interests of better merchandising.

To the electrical jobber who is used to working only about twelve or fourteen hours a day, golf holds many terrors according to the men assembled at the Jobbers' Convention at Coronado, Calif., recently. During the day when golf was enjoyed these hardy men were forced to ride from tee to tee in order that they might conserve their strength for future contests with brothers in the electrical business. The four men pictured here are prominent members of the hit-and-ride club. Judging from the fresh expressions on the faces of the men pictured above, we would say that the picture was taken before the ordeal on the links. R. W. Murphy, Pacific Coast manager of the Westinghouse Lamp Company, may be seen supported by his sticks and to the right P. H. Booth, sales manager of the Edison Electrical Appliance Company of Ontario, Calif., is imitating the Duke of Durham, monocle and all. B. E. Rowley, district manager at Salt Lake City, Utah, for the Edison Electrical Appliance Company, is completely worn out from the previous day's siege when, after securing a handicap of thirty, for a seventy-two par course, he annexed the silver trophy. Seated to his right is S. B. Gregory, Pacific Coast manager of the Arrow Electric Company, who is trying to arrange to have the car back up to the tee so that he may drive-off without arising from his position.

Trade Outlook

San Francisco

Retail business has just experienced one of the greatest periods in its history. Christmas sales exceeded expectations and in many cases stocks have been cleaned out. The demand for electrical household appliances was almost double that of last year. Tree lighting sets were in great favor. A last moment campaign on the part of the electrical industry had a further stimulating effect on business.

Prospects for the coming year are bright at the present time.

There is every indication that building activity will continue at the same high level set during the latter part of 1922 when all previous records were broken. The shortage of homes is still acute and the decided resumption of activity in industrial lines indicates that many plants will be enlarged.

Despite the failure of Congress to act on the ship subsidy, export houses report large shipments. The greatest demand is for machinery, foodstuffs, automobiles, lumber and wearing apparel. Storms during the month have covered the Sierras with a deep blanket of snow, assuring an ample water supply for irrigation and hydroelectric generation.

Bank clearings for the month of November amounted to $634,000,000, a gain of $61,000,000 over the same month in 1921. Banks report collections to be good.

Seattle

Business conditions on Puget Sound are reported exceedingly healthy and indicative of continued prosperity for the new year. Merchants report a satisfactory volume of holiday selling, with a demand from the public for the better class of merchandise. Christmas shopping started unusually early this year, and the volume was well sustained. Prices on most merchandise are appreciably lower, and the public is quick to note this condition.

Although lumber mills and shingle mills of western Washington have thousands of unfilled orders, and are anxious to make the holiday shut-down as brief as possible, early snow and cold weather have curtailed the log supply, and many mills will be forced to close for a considerable period. Virtually all logging camps in the higher elevations have ceased operations, due to weather conditions, and these camps are not expected to resume until late in the winter, and possibly early spring. Many West Side camps are also closed, but a brief period of rain or good weather will make it possible for them to reopen. The lumber industry continues to be handicapped by the car shortage, and this condition affects every manufacturer in the Northwest.

The demand for Christmas electrical goods was excellent during the holiday buying season. Electrical appliances, including vacuum cleaners, washing machines, percolators, irons, toasters, table stoves, waffle irons and flashlights, were in unexpectedly brisk demand. A number of electric ranges have been sold. There has also been noted a slightly revived interest in radio equipment. The cold weather of the past month has brought about an unprecedented call for small electric heaters, and this appliance is steadily growing in favor.

Los Angeles

Building permits for the first fifteen days of December showed a slight decrease over November. In building circles this was attributed to the unusually heavy rainfall and the holiday season. There were 2,212 permits issued with a valuation of $5,415,745. This was slightly less than for the same period last year which showed 2,408 permits issued with a valuation of $6,146,845. Due to the building which has been held up for the first fifteen days of the month, the outlook for the balance of December is most encouraging, and will undoubtedly come up to the same volume as December of last year both in number and valuation of permits.

Bank clearings for the first fifteen days of December amounted to $268,222,431.57 which compares with the same period of 1921, with $201,422,196.34, as an increase of approximately 25 per cent. This shows that retail buying is much brisker than a year ago. The electrical retailers reported a very encouraging volume of Christmas business and state that this season has been one of the biggest in their history. The sale of smaller electrical appliances has increased very materially and this may be attributed to the unusually large amount of newspaper advertising being done by all branches of the industry, particularly the electrical dealers.

Salt Lake City

With the close of the year 1922 conditions in the intermountain section present the most hopeful aspect since the demoralization caused by the world war.

One of the features of immense importance to this section is the regaining of financial and industrial poise by the large sugar companies, which are now on a footing to proceed with the conduct of their great enterprises in a sure-footed and confident manner.

In addition to the distribution of approximately $4,000,000 in October and $2,000,000 in November among the farmers in payment for beets, the sugar companies distributed about $1,000,000 to these same farmers under their profit-sharing plan. This has been a life-saver to the farmer, and has in turn been reflected in better conditions throughout this entire territory.

Practically all industries are operating with increased forces, on full time, except smelters and refineries, which are at present operating more than 50 per cent, with prospects of a 100 per cent basis soon.

Jobbers report that the intermountain section is now at its highest purchasing level for a period of several years. Mining activity continues, and the Utah Copper Company at Bingham is constantly increasing its operations and adding to its forces.

The holiday trade produced a good demand for electrical merchandise for Christmas presents, and the seasonal activity was fairly satisfactory. In Salt Lake City construction work undertaken during the first eleven months of 1922 exceeds that of the same period in 1921 by $500,000.

Denver

Holiday business proved far better than anticipated and is regarded as another sure index of the again safely entrenched prosperity of this region. With the exception of certain farming areas, all reports from bankers, merchants, and public officials are encouraging. Cold weather has not impeded building operations and with a steadier supply of construction materials, it is believed that the program of the coming year will surpass that of 1922.

The release of nearly a half million dollars of Christmas savings deposits resulted in a brisk holiday trade locally. In electrical lines, added impetus was given by the cooperative advertising campaign. As much as a week before Christmas several jobbing houses were compelled to refuse further orders on a number of popular lines of appliances. Christmas tree lights were in unusual demand along with smaller heating appliances and hollow ware.

Conditions surrounding the wire market are about the same, with several eastern manufacturers bidding low for local representation. There is an ample supply of conduit, armored cable, and loom on hand with improving freight deliveries.

The first week of January will see many Denver electrical dealers busy taking inventory. As a result of the heavy Christmas trade, stocks are low and orders from dealers should be forthcoming.

Portland

Recent cold, dry weather has had an effect on general business conditions. Building trades and general construction have been much reduced and Christmas shopping delayed. The power companies were forced to carry record-breaking loads largely on steam, due to the extreme low water in the streams. The condition has changed in the last week with the coming of warm rains.

Lumber production for the first time in months, is below normal, as indicated by the West Coast Lumbermen's Association report for the week ended Dec. 16, 1922. At that time production was 13 per cent below normal, new business was 14 per cent above production and shipments 2 per cent below new business. Lumbermen in general, however, are very optimistic about the coming year, and point to a steady growing demand on the Atlantic Coast.

A business report from electrical dealers indicates that December business was not as large as anticipated. However, holiday buying in devices and heaters was very active and the volume of electrical appliances purchased as Christmas gifts is expected to exceed that of last year.

Construction News

Bridges

Ariz., Yuma—Southern Pacific Railway plans construction of a $2,000,000 bridge across the Colorado River at Yuma. The work will include rearrangement of yards at that point. The structure will be located between two buttes known as Prison Hill and Indian School Hill. A rock cut will be necessary at both ends, and a viaduct and trestle on the California side spanning the state highway and the Yuma project canal. The main portion of the bridge will probably consist of a single span, 500 ft. long. Chief Engineer G. W. Beschke is in Yuma arranging for right-of-way and transfer of property. Plans have been prepared and actual work will begin as soon as legal arrangements have been completed.

Ariz., Phoenix—Pacific Construction Company, Phoenix, submitted low bid to state highway department at $72,336 (or $1.37 per sq. yd.) for surfacing 5 miles of the Superior Mesa highway with 2-in. asphaltic concrete.

Ariz., Phoenix—Bids are being received by Thos. Maddock, state engineer, for constructing two 75-ft. pony truss spans and three reinforced concrete piers across the Rio Puerco near Sanders, Arizona. The work involves 450 cu. yd. excavation, 160 cu. yd. concrete, 6,500 lb. reinforced steel, steel superstructure in place, wood floor and approaches complete in place. Plans and specifications upon payment of $5. Certified check 5 per cent.

Ore., Coquille—Bids are asked for by the county court of Coos County for the construction of a steel bridge. The steel bridge will be over the Catching Slough near Marshfield, requiring approximately 66,000 lb. of structural steel, 65 M. ft. lumber, 11,000 lin. ft. piling, 725 lin. ft. trestle and 6,500 ft. of machinery.

Ore., Klamath Falls—The state highway commission is having plans prepared for a steel bridge over the Klamath River on the Klamath Falls-Keno section of the Ashland-Klamath falls highway. The bridge across Lost River about two miles northwest of Merrill has been accepted by the commission. Plans and specifications for the grading of the Klamath Falls-Keno section of the highway have been authorized and the advertising for bids on the actual work of grading will follow soon.

Utah, Salt Lake City—Contract for four bridge structures on the Zion National Park highway in Washington County has been awarded to Snow, Cannon & Kemp, of St. George, Utah, on a bid of $65,337.71.

Wash., Seattle—Jahn & Bressi, of Seattle, were the lowest bidders for the contract to construct the steel superstructure of the West Spokane Street bridge. Each bidder was required to make an offer under two sets of plans and specifications, one drawn by the city engineering department and the other by the Strauss Bascule Bridge Company. Under the first plan, Jahn & Bressi submitted a figure of $460,700 and under the latter $444,923.

Dams

Idaho, Boise—Construction costs for the Black Canyon Dam in the Payotte River near Emmett are provided in the recommendations made by President Harding to Congress of $1,390,000 for the Boise project. J. B. Bond is in charge of this project.

Ore., Durfur—The Durfur Orchards Co. has asked permission to construct Dead Horse Reservoir, storing 1,500 acre-ft. of water from Eight Mile Creek, Tamarack Creek and Dead Horse Canyon. The dam to be built will inundate 60 acres. Work will begin next summer and the total cost is estimated at $145,000.

Ore., Medford—The contract for the building of the new city reservoir has been awarded to Lindstrom & Fiegenson of Portland. The reservoir is to have a capacity of 2,000,000 gal. and will cost about $27,500.

Utah, Price—Bonds have been voted favoring the building of the Pleasant Valley reservoir, which will cover 3,300 acres or five square miles of land just below Scofield. The dam will be 120 ft. wide at the base, and 90 ft. high. The building of this irrigation system will cost about $600,000, and it is expected to be finished so as to store water in the winter of 1923-24 for the 1924 crop season.

Wash., Stevens County—The Inchelium Water Power Company is to build a dam and divert the waters of Stranger Creek for the use of a hydroelectric plant, for power, lighting, manufacturing and irrigating purposes.

Highways

Calif., Ventura—The Fairchild-Gilmore-Wilton Company, L. A. Railway Building, Los Angeles, was awarded contract by county supervisors at $38,600 for paving 3.05 miles of Guiberson Road about 1 mile south of Fillmore.

Calif., Sacramento—The estimated cost of the proposed Sacramento-Sutter counties extension of the river highway has been placed at $750,000. The proposed road will be 26.49 miles in length, and will extend from the end of the Natomas Boulevard District 1,000, Sacramento County, to Oswald in Sutter County. The money will be raised as follows: State of California, $100,000; interested land owners, $150,000; Sutter County, $325,000 (including a bridge approach on the highway); Sacramento County, $175,000. John Russi, supervisor of Sacramento County, H. J. Heiken, of Sutter County, and James K. O'Brien, of Yuba, are directors of the new joint highway district.

Calif., Yuba City—Plans for the proposed 2,000-ft. concrete causeway to span lowlands between the new steel bridge over Feather River at Nicolaus and the west levee have been ordered by the county supervisors to be prepared by Earl Cope, engineer. The causeway will be a link in the proposed Sacramento-Sutter joint boulevard, and will cost approximately $150,000.

Calif., Sacramento—At a meeting here of members of the state highway commission, a highway district composed of the counties of Santa Barbara, Kern and San Luis Obispo, and the federal bureau of public roads of the U. S. Department of Agriculture, confirmation was made of a contract awarded some time ago to C. H. Hudson, of Los Angeles, for 15 miles of construction on the Cuyama highway from Santa Maria to Maricopa, in Santa Barbara County. The contract price is $491,602.30. Construction will be under the supervision of the bureau of public roads.

Calif., San Francisco—The contract for completing Sloat Boulevard on the east side from 19th to 37th Aves. has been awarded to Eaton & Smith for $40,266. This will give two strips of boulevard, each 50 ft. wide, which will permit of one-way traffic for cars using the boulevard between the beach esplanade and the peninsula.

Calif., San Francisco—W. H. Goodin, national director of the Victory highway for Nevada, recently announced that work on the Wendover route of the highway in that state would start about March 1. A campaign has been started in California to raise $150,000 for assistance in this highway construction. The money raised will go to match federal aid and will hasten construction of the road. Mr. Goodin announced that as 91 per cent of land in Nevada is government-owned, it is impossible to build the road without outside aid. Government engineers will make the surveys.

Colo., Denver—The 1923 budget of the state highway department, prepared by L. D. Blauvelt, state highway engineer, will include appropriations totaling approximately $1,000,000 for improvements on the north and south highway, the state's most heavily traveled interstate road. The improvements will include concrete paving, bridges, tunnels under railroad tracks, etc. Following is a list of the projects on this highway which extends from the Wyoming line to the top of Raton pass, with two branches north from Denver: From Loveland south toward Berthoud, $92,000; from a point about a mile north of Broomfield toward Lafayette, $100,000; from Wolfhurst south toward Sedalia, $140,000; from the end of the last project south toward Sedalia, $112,000; from Colorado Springs north toward Denver, $273,000; elimination of two grade crossings south of Colorado Springs, $25,000; surfacing north of Pueblo, $25,000; from Trinidad north toward Aguilar, $90,000; from Fort Lupton north toward Greeley, $100,000; total, $957,000. The old projects taken over from the 1922 budget are those calling for the expenditure of $140,000 for the continuation of the concrete pavement south from Wolhurst and the $273,000 item for the laying of concrete pavement north from Colorado Springs. With the exception of the two sums set aside for surfacing north of Pueblo and for the elimination of two grade crossings south of Colorado Springs, all appropriations will be used for concrete pavement and subways under railroad tracks. It is estimated the money will be sufficient to construct two subways, one just south of Wolhurst and the other at Breed, about five miles north of Colorado Springs, and extend the pavement twenty miles or more.

Ore., Portland—At a meeting of the State Highway Commission, held Dec. 13, bids were opened on six projects. In the case of the two grading and surfacing projects and the bridge over Lost Creek, all in Lane County, the low bids were satisfactory and all were referred to the engineer to confer with Lane County court. These bids were as follows: Goldson-Cheshire section, Willamette Valley-Florence highway, 4.1 miles—low bidder A. C. Mathews, Eugene, $40,920. Goshen-Lowell section, Willamette highway, 8.7 miles—low bidder Warren Construction Company, $82,571. Lost Creek Bridge, Willamette highway—low bidder E. D. Olds, Oak Grove, $9,330. In addition the following awards were made: Murder Creek section of Pacific highway in Linn County—.62 miles of concrete paving awarded to Soleim & Gustafson of Astoria on a bid of $15,273. Tangent Shedd section of Pacific highway in Linn County—1.95 miles of paving; referred to engineers with power to act. A. D. Kern of Portland had low bid of $50,606. Rainier City section of Columbia River highway in Columbia County, .91 miles of paving. Awarded to A. D. Kern of Portland on a bid of $23,713. Sandy-Cherryville section of Mount Hood Loop, 7.4 miles of gravel surfacing in Clackamas County. A. D. Kerns' low bid of $24,336 declared satisfactory.

Ore., Salem—An appropriation for the construction of the Mount Hood Loop road was passed at a special meeting of the tax supervision and conservation commission. The amount allotted for the construction is $245,000, of which $170,000 will be spent in Clackamas County, while the remaining $70,000 will be used for the construction in Multnomah County. The entire appropriation will be taken from the state motor vehicle fund.

Ore., Portland—An award has been made by the State Highway Commission to Metzger & Johnson of Roseberg, Ore., contractors, for

crushed gravel surfacing of 12.1 miles of road on unit No. 2 at the Sarvice Creek Valades highway. Their bid was $38,334.

Ore., Baker—The Johnson Contract Company of Portland has been awarded the contract for the surfacing and grading of 14.35 miles of market road to Baker.

Ore., Portland—The State Highway Commission has under consideration the construction of an interstate highway which will not only tap Washington but will also make connection with Lewiston, Idaho. The matter will be taken up with federal officers in a conference.

Ore., Salem—After two years of negotiations between the federal government and Marion County a contract has been signed, thereby assuring a highway between Detroit and Niagara, Ore. The total cost of the 13 miles of road is placed at $100,000. Work is expected to start with the coming of spring.

Utah, Salt Lake City—The state road commission has awarded contract for construction of between 7 and 8 miles of gravel surfaced highway between Ash Creek bridge and Anderson's ranch, on the Salt Lake-Zion National Park highway, to McArthur, Winsor and Whitehead of St. George, at an estimated cost of $87,070.68.

Wash., Spokane—Rock work will be started soon on the unit of the national parks highway between Hope, Idaho, and Pike River. 8.6 miles of roadway is to be constructed at a cost of $171,000.

Wash., Spokane—Road contracts amounting to $300,000 will be awarded by the county commissioners in January, when the bids for the Trent Road and other improvements will be opened. The Trent road will be paved with concrete from the end of the present paving at Trent to the Idaho line. This contract will be for eight miles and will amount to about $200,000. Another contract will be the seven miles of macadam road extending west from Plaza into the wheat district. Another five miles to be constructed is the Five Mile Prairie Road, also one mile of the Waikiki Road. D. H. Ham is the commissioner.

Irrigation Projects

Mont.—Twenty-three irrigation districts in Montana under state supervision have been projected since the passage of the act by the legislature two years ago, which authorized financing and construction of irrigation projects under state supervision and control. They embrace a total acreage of 332,666. Of these, two have been completed to the extent that the districts have been created and improved and bond issues sold. These are the Red Lodge-Rosebud district in Carbon County and the Whitetail district in Jefferson County. Construction on storage and distribution units will be begun on both this fall.

Nev., Fallon—A contract between the government and the Nevada Valleys Power Company, providing for 10-year lease of the Lahontan power plant to the Nevada Valleys Power Company, has finally been signed by Secretary of the Interior Fall, according to J. F. Richardson, manager of the Newlands project. The Newlands Project Irrigation Board recently suspended approval of the contract owing to the objections of numerous water users. The agreement clears the way for the Spanish Springs reservoir, on which preliminary work will soon start. This work includes construction of the reservoir, dam, ditches and canals. Reclamation service officials state that besides increasing the water supply of the Newlands Project the Spanish Springs reservoir will facilitate reclamation of 87,000 acres of new land, one-third of which lies near Wadsworth in Washoe County and directly tributary to Reno.

Wash., Yakima—The Tieton Water Users' Association contemplates the enlargement of canals and laterals at a cost of $1,000,000.

Wash., Hillyard—The voters of the North Spokane Irrigation District have voted a bond issue of $75,000 for construction of a new water system to irrigate the district.

Wash., Wenatchee—Construction work on the new Whitestone Irrigation project in Okanogan County has been started under C. P. Hertvedt, superintendent. During the winter two tunnels will be completed, one to be 1,400 ft. long, 5 x 7 ft. in size, and the other 500 ft. long, 5 x 6 ft. in size.

Wash., Yakima—Voters of the Granger Irrigation District have adopted the plans of the Reclamation Service to irrigate 1,500 acres of land at a cost of $225,000, as the result of a recent election. Work will be started immediately, and water ready for spring irrigation will be provided.

Wash., Hanford—Actual construction of the Priest Rapids (Wash.) irrigation project by which 80,000 to 100,000 acres of land in Grant County will be irrigated, will begin early in 1923, according to R. A. Hill, Los Angeles engineer.

Power Plant Equipment

Calif., Lompoc—The $30,000 bond issue to purchase the Lompoc Light & Power plant carried at the recent election.

Calif., Sacramento—Nevada-California Electric Corporation plans to expend about $8,000,000 within the next ten years for construction work and additions to present system. Included in the new construction work of the corporation, which now supplies power to the mining industry of Nevada and industrial and agricultural districts in southeastern California, will be seven new hydroelectric plants which will give an added capacity of 46,500 hp.

Power Projects

Wash., Spokane—The Washington Water Power Company has sent its second surveying crew into the field to make a preliminary survey for the new high tension power line between the east end of its lines in central Washington to Pateros where connection is to be made with the lines of the Okanogan Light & Power Co.

Wash., Tacoma—City council has granted an appropriation of $50,000 from the light department funds for clearing the power house site, the equalization reservoir site and the flume line location for the development of the Lake Cushman power project, the appropriation to be met from the current earnings of the department.

Wash., Wenatchee—Chelan County commissioners have granted the Washington Water Power Company a franchise to enter the county at Chelan Falls and run a line north to Okanogan County.

Railways

Ariz., Phoenix—R. E. McKee Construction Company, El Paso, Texas, awarded contract at about $850,000 to erect the new Union Station, has started work. Construction will be supervised by E. C. Forney and G. H. Wyman of Los Angeles. The structure will be part 2-story and 1-story; 475 ft. long and large enough to accommodate six tracks. It will be Mission style, with pebble-walls and red tile roof.

Calif., Eagle Rock—Architect Frederick Hastings Wallis, 330 Pacific Finance Building, is preparing plans for a railway depot at Eagle Rock for the Glendale-Montrose Rwy. Company. It will be 31 x 28 ft., and will contain a waiting room, office, store and lavatories, monolithic hollow concrete wall construction, plaster exterior, composition roofing, plate glass, cement floors.

Calif., Santa Barbara—The Pacific Southwestern Railroad Company has been authorized by railroad commission to issue and sell at not less than par $100,000 common stock, to construct a standard gage line from Lompoc on the line of the Southern Pacific Railway in Santa Barbara County to Whitehills, about four miles.

Calif., Sacramento—The California Railroad Commission has given permission to this city to construct a subway under the tracks of the Southern Pacific Company at 16th and B Streets. Estimate on the cost as prepared by Albert Givan, city engineer, is placed at $80,000, which will be borne equally by the city and the Southern Pacific Company.

Calif., San Bernardino—W. J. Burton Company has the contract to build about half of a proposed double track line between Daggett and Bagdad, 68 miles, for Santa Fe Railway. Estimated cost of entire project, $3,000,000. Grading will start at once.

Idaho ,Boise—The Oregon Short Line Railroad Company has started work on construction involving the expenditure of $1,500,000 between Hammett and Reverse. Four lines of track will be abandoned to eliminate the Medbury hill which has caused considerable difficulty to trains with heavy loads. The grade will be changed from 2 to 1.45 per cent and will save two miles in haul. The first work on this project started with the construction of a 10-ft. arch on Bennet Creek. The contract has been let to the Utah Construction Company. The state highway for the distance of a mile paralleling the track will also have to be changed. The new line will be ready for use by the time heavy crop traffic starts next fall. The Oregon Short Line has just completed 18 miles of double-track construction between Hammett and King Hill, involving the heavy expenditure of funds. The company will also construct a railroad link from Orchard to Boise. A handsome depot is to be built in Boise. Plans are being made by Carrare and Hastings of New York. The building will be of native stone and terra cotta and will cost about $150,000 to $200,000.

Ore., Klamath Falls—The Strahorn Railroad from Hilderbrand to Sprague River is now in the process of building. The grading contract assigned to Nettleton, Bruce & Echbach Co. of Seattle calls for the sum of $175,000. In addition to this there is a 1,500-ft. tunnel which this same company will put through under a separate contract. The road must be completed and in operation by the last of May, 1923; 300 men are employed.

Wash., Kelso—The Longview, Portland & Northern Railway Company, organized by the Long-Bell Lumber Company, will receive bids on grading and construction of trestles for the first 8½ miles of its railway, Jan. 2. Bids will be received at the office of the company in Kelso. This will be the first unit of approximately 26 miles of railway to be built by the company to tap the timber holdings of the Long-Bell company. The project involves handling of better than a million yards of earth in grading operations. The railway will be on the west side of the Cowlitz River and the first unit includes the line to a point south from Castle Rock.

Streets and Sewers

Calif., Los Angeles—Chas. U. Heuser, Hotel Clark, Los Angeles, has been awarded contract by Board of Public Works, at $124,500 for constructing Section 4 of the temporary outfall sewer between Rimpau Blvd. and Ballona Creek, involving 1,800 ft. 48-in., 5,710 ft. 54-in. and 735 ft. 30-in. segmental block sewer at a total of $107,000, and 3,500 cu. yd. concrete reinforced in place at $5 yd.

Calif., Watts—City trustees have adopted resolution of intention No. 984 for constructing proproposed city sewer system under new proceedings. The contract was previously awarded to Thompson & Packard, of Salt Lake City, but owing to errors in the proceedings, they refused

to sign the contract. Old proceedings were then abandoned and the new resolution adopted. The project will involve 64,746 ft. 6-in., 41,186 ft. 8-in., 17,926 ft. 10-in. and 5,660 ft. 20-in. cement; 2,552 ft. 18-in. pipe; 369 manholes, 55 flush tanks and 6-in. wye for each lot. Work will be done under 1911 Act and 1915 Bond Act. Koebig & Koebig, consulting engineers, Title Insurance Building, Los Angeles.

Calif., Venice—City Engineer Griffin is preparing plans for the opening of Trolleyway between Mildred and Nautilis Aves. Eight street and two sewer projects are in process of formation, all with a view toward opening up the area back of the city of Venice. Work will involve 4-in. concrete, rock and oil paving, walks, curbs, and lighting systems, 1911 Act. Total estimated cost, $100,000.

Calif., San Marino—Bids are being received by city trustees for constructing an outfall sewer in the city of San Marino, consisting of approximately 2 miles, 12-in. to 20-in. pipe. Plans and specifications are on file at the office of the city clerk, H. W. Joyce, at the city hall, at Huntington Drive and Olive Drive, opposite the San Marino station of the Pacific Electric Railway, or at the office of William Chalmers, engineer, 61 So. Raymond Ave., Pasadena. Certified check or bond, 10%. The sewer is a section of a new Pasadena line running through San Marino and Alhambra to Pasadena sewer farm. Bonds to amount of $40,000 have been voted by San Marino.

Calif., Fresno.—City Engineer Wm. Stranahan is preparing plans for the construction of a drain sewer system in about 20 city blocks along Stanislaus St. from the alley between L and M Sts., to H St. It will connect with the present outfall sewer. The pipe will be 24-in. and will replace the 8-in. pipes now in place.

Calif., Alhambra—Construction has started on the first unit of Alhambra's new sewer system for which bonds to the amount of $300,000 were voted last June. The city has been formed into districts for this work, district No. 1 being the first section in which mains will be laid. Cox & Teget have the contract for this district.

Mont., Winnett—Sewers are to be constructed for Winnett at the cost of $25,000, for which bonds have been voted.

Ore., Portland—An extensive street widening plan is proposed in a 1,436-page report by City Engineer Laurgaard, recently filed with City Commissioner Barbur. The report indicates that the combined widening of East Burnside, Couch and Sandy Boulevard, together with the extension of Sandy Boulevard, would cost $383,425.

Utah, Salt Lake City—Work has started on 17 miles of sewers on extension 410, north of the state fair grounds. The cost of the improvement which includes 29,000 ft. of pipe will be $85,000, the contract having been awarded to John O'Connor recently. The farmers ward extension, including 20,000 ft. of sewer, is also under way. The contract was awarded to J. L. Griffin and W. H. Burnside at $120,000.

Wash., Seattle—Estimates for the proposed trunk sewer in 34th Avenue West, et al., places the cost at $94,273. Work will probably begin early in the new year.

Wash., Pullman—About $63,000 will be spent for an adequate and sanitary sewage disposal system for Pullman. The state will be asked to contribute part of the expense and the balance raised through the sale of bonds, according to G. H. and H. S. Green, consulting engineers of Spokane.

Wash., Seattle—Contract for installation of sewers and grading in 16th Avenue Northwest, has been let to Tomei & Co. of Seattle, on their bid of $30,298, for clay pipe.

Wash., Seattle—Contract for sewers in West 62nd Street, et al., has been let to Alexander & McNeil, Seattle, on a bid of $22,260, for clay pipe.

Wash., Seattle—Hague & Espland, Seattle, on their bid of $104,706, received the award of contract for paving and trestle work on Railroad Avenue. This work involves 7,750 sq. yd. of concrete paving and 43,000 ft. of creosoted piling.

Wyo., Cheyenne—Resolution before city council to create Paving District No. 1, covering forty city blocks. Actual construction of this $300,000 improvement will be started in the early spring.

Street Lighting

Wash., Toppenish—A contract has been authorized by the city council of Toppenish to provide for the furnishing of electric lighting service by the Pacific Power & Light Co. for ten years.

Waterworks

Calif., Los Angeles—City council has adopted ordinances calling special elections Jan. 25 for water distributing systems as follows: $100,000 in Angeles Mesa District (Municipal Imp. Dist. No. 14), and $200,000 for the Palms district (Municipal Imp. Dist. No. 18). At a special election held Dec. 12, in Sawtelle district, a $275,000 bond issue for mains and a distributing system carried.

Ore., Orenco—A water merger is being planned whereby several cities in the Tualatin valley will be able to have city water from Portland's supply at a lower cost than if each city had its own system. The project would embrace an area of approximately 200 sq. miles, with an aggregate expenditure of about $1,000,000.

Wash., Bucoda—A water system is to be constructed by the American Wood Pipe Co. of Tacoma for Bucoda. The system will include two 60,000-gal. reservoirs and will cost about $25,000.

Wash., Birmingham—The Birmingham Water Company, following a hearing of complaints, has been ordered by the State Board of Public Works to double the size of its trunk line; to extend the intake 1,000 ft. into deep water of Lake Martha, install a chlorination plant, and not to collect further rent until these improvements are completed.

Wash., Spokane—A reservoir for the city water system is to be built on the north side next year, and surveys are now being made for the site. The cost is estimated at $100,000.

Wash., Odessa—Installation of a filtration plant at Lewiston, Idaho, to purify the water taken from the Clearwater River for city use, will be the solution to the water problem, according to City Water Superintendent E. C. Wagner. The plant with enlargements to the water system will cost $350,000.

Miscellaneous

Colo., Denver—The Denver and Interurban Railroad Company has started construction of new car barns at Thirty-sixth and Fox Streets, under the direction of Allison Stocker, a local contractor. The new barns are necessitated through the changed routing of the system which brings the interurban cars into the Union Station instead of on the downtown streets as formerly. Modern machinery will be installed, including electric turntables.

Colo., Denver—The Globe Investment Company of which L. C. Fulenweider, George W. Olinger, and R. H. Bosse are the active officers, has practically completed plans for an exclusive residential development project to be known as the Welshire district of this city. Plans provide for complete landscaping of the area, the laying of approximately ten miles of pavement and the installation of an ornamental lighting system.

Wash., Freeport—Pipe Plant—The Concrete Pipe Company has completed plans for a large plant near Freeport in connection with the Long-Bell Lumber Company's development at Longview. Plant will manufacture sewer pipe for the immense sewer system planned for Longview, which will require more than 50 miles of pipe.

Wash., Seattle—The Associated Oil Company plans the expenditure of $115,000 in development work at its big $1,000,000 ocean terminal at 1739 Railroad Avenue. Proposed work includes five large steel oil storage tanks, fireproof warehouse and garage building.

Buildings (Industrial)

Colo., Denver—A three-story building to house the largest taxidermy firm in the West will be built at Tenth and Broadway by George L. Bettcher for Jonas Brothers. An extensive cold storage system will be installed for the storage and preservation of furs.

Ore., Haines—The plant of the Commercial Creamery Co. which was recently destroyed by fire at an estimated loss of $60,000 is to be rebuilt as soon as insurance adjustments are made. This is announced by A. H. Goodhue, of Spokane, president of the concern.

Ore., Portland—A $35,000 warehouse is to be added to the Western Cooperage Company's plant. Plans prepared by DeYoung & Roald; the building will be one-story, 200 x 400, with corrugated iron sides and roof.

Ore., Portland—A two-story warehouse for the National Cold Storage & Ice Company is to be built by Bingham & McClelland, 416 Worcester Building. The structure will occupy a 200 x 100-ft. space of ground and will cost approximately $80,000. It will be occupied when finished by the Pacific Fruit & Produce Co.

Wash., Hoquiam—The Grays Harbor Home Building Corporation has been organized and is starting work on the construction of an $85,000 factory for turning out lumber cut to patterns for houses. The new company was founded by A. B. Arthaud and Charles Kane.

Wash., Vancouver—A paper mill will be constructed on the water front site of the old Pittock-Leadbetter Lumber Co.. The investment will be about $1,500,000 as announced by the California-Oregon Paper Mills.

Wash., Aberdeen—A contract for the construction of a two-story concrete warehouse to be built by the A. A. Star Transfer Co. was awarded to the Green Engineering Co. The building which will cost in the neighborhood of $45,000 will be built at Hume and K Streets, and will be of the mushroom concrete type throughout and will contain warehouse facilities, freight elevator and office.

Buildings (Miscellaneous)

Calif., Whittier—Bank—Architects John Parkinson and Donald B. Parkinson, 420 Title Insurance Building, report that the new building for the First National Bank of Whittier will be six stories instead of two-story and basement. Contracts have been awarded as follows: General contract to Macdonald & Driver, Douglas Building, structural steel to Baker Iron Works, plumbing to Arthur Hess, and heating to Whittier Hardware Co. Total cost, exclusive of bank fixtures and equipment, $250,000.

Calif., Los Angeles — Apartments—Architects Russell & Alpaugh, 1106 Story Building, have been commissioned to prepare plans for an 8-story, class A apartment house to be erected at Wilshire Blvd. and Carondelet St. for Wilshire-Carondelet Holding Co. The building was originally designed as a 4-story, class C structure. It will contain 376 rooms and 188 apartments. Cost, $700,000.

Calif., Redlands — University—V. L. Duke, president of the University of Redlands, and George P. Cortner, business manager, have announced that three new buildings costing about $150,000 are to be erected before next fall. One is to be the second wing of the great fine arts group. This wing is to be east of the first

wing and will cost about $35,000. The two wings will later be connected with the big auditorium and chapel to be built; a boys' dormitory, to cost about $60,000, is to be built just north of California Hall; and a girls' gymnasium with a seating capacity of 1,200 where basketball games will be played is to be erected.

Calif., Los Angeles—Depot—Wurster Construction Company, Union Terminal Building, was awarded contract for erecting an additional building at 7th and Alameda Sts. for L. A. Union Terminal Company. John Parkinson and Donald B. Parkinson, 420 Title Insurance Building, architects. Cost, $500,000.

Calif., San Diego — Barracks, etc. — R. E. Campbell Construction Company, Salt Lake City, has been awarded contract by bureau of yards and docks, naval department, at $193,-351.60 for constructing a group of buildings at the Loma Portal naval training station. The group will comprise buildings for officers, barracks, pump house, etc.

Calif., Fresno—Lodge—Fresno Aerie, Fraternal Order of Eagles, has announced plans to erect a six-story office building on M and Fresno Streets. The building will cost $500,000 and will be erected during the coming year.

Calif., Visalia — Bank — Bank of Italy, 550 Montgomery St., San Francisco, is taking bids for the erection of a five-story reinforced concrete bank and office building at Visalia, to cost $250,000. Plans by Architects R. F. Felchin Co., Bank of Italy Building, Fresno. Mr. Cuneo, of the bank, has charge of construction, figures, etc.

Calif., Visalia—Stores—Offices—F. H. Whipple has had plans prepared for a 3-story brick bldg. which he will build at Bridge and Main Sts. The building will contain stores and offices, and cost $100,000.

Colo., Colorado Springs—Hospital—Trustees of the Union Printers' Home here have approved an extensive building campaign to include immediate construction of a $125,000 addition to the main building for hospital purposes. The new structure will provide for 100 patients and will be of the latest design, according to Secretary J. W. Hays.

Colo., Denver—Film Exchange — Construction of an exclusive film exchange building, 125 ft. long and 115 ft. wide and 3 stories high on the new Broadway extension at a cost of $125,000, has been started under the direction of E. H. Moorman, a local architect, for a Denver syndicate.

Colo., Eagle—Hotel—A modern hotel, three stories high on one of the main business corners, will be built and operated by a local company headed by John Weld. William Redding & Son of Denver are the architects.

Colo., Denver—Offices—A $350,000 office building for the exclusive use of the district office of the U. S. Veterans Bureau will be built by a local concern opposite the Civic Center providing court action does not interfere. The construction of such a building would upset the plans of the municipal planning commission and because of public sentiment a new site may be obtained. The C. S. Lambie Co. has the general contract.

Colo., Denver—Freight Depot—P. J. Sullivan has been awarded the contract for the construction of the new Union Pacific freight house on Nineteenth Street at a cost of $300,000. It will be 850 ft. long and will have two stories, part of which will be used for office purposes. Milroy & Horan have been awarded the sub-contract for the electrical work.

Colo., Denver—Apartment—Store—A store and apartment building to cost $50,000 will shortly be started by Albert Werner, a prominent South Denver merchant, at 76 to 86 South Broadway.

Colo., Denver—Garage—A 6-story garage, the largest of its kind in this section, is planned for construction by George Williams of this city. Thomas F. Walsh is the architect; ground for the foundation is expected to be broken within a short time.

Colo., Colorado Springs—Store — With the transfer of several valuable pieces of property in the center of the business section to the L. R. Steel Co. for $250,000, it has been announced that the company will remodel and build a new home for its merchandising activities here. Will L. Hahn of Denver is the western district manager of the corporation.

Colo., Denver—A two-story fireproof office structure to cost at least $150,000 will be built by the school board of this city for the administrative department of the district. As soon as the bids are accepted construction will be started, according to W. N. Bowman, the architect.

Colo., Denver—Hotel—The first of three palatial apartment hotels to be built in this city by the Fleisher Construction Company will be started before the first of the year, if the plans of W. N. Bowman, architect for the project, materialize. The first building will cost $400,000 and will contain 45 apartments all modernly appointed. It is understood that electric ranges and refrigerators will be installed.

Colo., Denver—A twelve-story store and office structure, which may include a theater, to cost $800,000, will be built at 16th and Curtis Streets, one of the principal downtown corners, by the Bishop-Cass Investment Company. Notification has been given to the tenants of the present two-story structure on the site to vacate by June 1.

Colo., Denver—Clubhouse—The Denver Press Club will build a new clubhouse on the site of its present home at 1330 Glenarm place at a cost of $25,000, according to Warren E. Boyer, the club secretary. One of the features of the building will be the modern system of illumination.

Colo., Denver—Church—Construction work on the new Sacred Heart church opposite City Park has been started, according to Mountjoy & Frewen, the supervising architects. The estimated cost is $250,000 and when finished it will be the center of a religious community which will include a rectory, parochial school, and convent.

Idaho, Moscow—Dormitories—Two new dormitories for the University of Idaho, one for men and one for women, seem assured by the action recently taken by the University of Idaho Building Association. This association, composed of Moscow business men, will erect the buildings and lease them to the University. The plan calls for work to commence soon on the girls' building and to finish the men's building during the summer of 1923. Each building will cost approximately $100,000.

Mont., Butte—Hotel—A new hotel to cost between $750,000 and $1,000,000 is planned by Architect George H. Shanley of Great Falls. Work is expected to begin as soon as weather conditions permit. A fund of $300,000 has been subscribed.

Mont., Lewiston—Hospital—A deaconess hospital is to be erected at a cost between $150,000 and $200,000, and funds for the same are now being raised.

Mont., Helena—Institution—The State Institution for the Feeble Minded located at Boulder is to have four new buildings costing about $200,000. The new buildings will afford additional quarters for residents at that institution. The foundations are now in process of construction.

N. M., Fort Bayard—The government will spend $150,000 within the next few months for the erection of new buildings at Fort Bayard.

Ore., Helix — School — The new Helix High school building has been started, the contract having been awarded to Waale-Shattuck Co. of Portland at $45,439. Raymond Hatch, of Pendleton, Ore., architect.

Ore., Portland—Apartments—A contract for the erection of a three-story concrete building to be known as the Hendrickson Apartments has been let by Claussen & Claussen, architects, to Contractor E. B. White, 102½ Second St., Portland. The buildings will contain 17 apartments with modern conveniences, including electric ranges. The total cost will be about $60,000.

Ore., Portland — Apartments — A two-story apartment house to cost $25,000 is to be erected on East 14th and Hancock Streets. Lawrence & Holford have planned the building with a frame construction and stucco exterior and will contain eight apartments.

Ore., Portland—Salesrooms — A general contract for the erection of the Bergmann Shoe Co. building at 28th and Thurman Streets has been awarded to Roy O. Powers of Portland. The building will cost $45,000. Claussen & Claussen are the architects.

Ore., Portland—Hospital — General plans for the Shriners' Hospital for Children to be erected on Sandy Boulevard have been approved by the committee and the grading contracts will be let shortly. Sutton & Whitney of Portland are the architects. Plans preparatory for the contractor's figures will not be ready for some time.

Ore., Eugene—Hotel—A nine-story hotel building is being planned by Tourtellotte & Hummel, of Portland, for the location at Willamette and Tenth Streets in Eugene. The work of financing the project is estimated to cost $300,000, and will be carried on this winter, construction starting early in the spring. Frank Berger and James Clark are promoting the new hostelry. The building will cover 160 x 120 ft. and will be of reinforced concrete with the first two stories of art stone. Six stores will be located on the ground floor, lounging room, restaurant, dining room and large ball room. There will be 148 bedrooms with private bath and 107 without.

Ore., Salem—Institution — The Rounds-Chlist Company is to erect a group of structures for the Oregon Employment Institution for the Blind, to be erected between East 84th and East Glidan Street in Portland, consisting of an administration building, men's dormitory, work shop and power house. Plans were prepared by Houghtaling & Dougan. Contract price, $105,148.

Ore., Portland — Apartments — A three-story brick apartment house is to be erected on Lownsdale St., between Taylor and Yamhill, and will cost about $60,000. C. L. Goodrich is the architect for the building, the plans of which are in the hands of the contractors.

Ore., Salem—Apartments—A four-story apartment house is to be erected immediately on the corner of Court and Capital Streets as announced by Carl L. Linde, the Portland architect who is to have the supervision of the plans. The Capital Apartments Company is to finance the building of the structure at the estimated cost of $250,000. The building will be of reinforced concrete and will contain a total of 68 apartments of the most modern type.

Ore., Portland—Store—A two-story retail store is to be built at Park and Washington Streets on the present site of the Star Theater. The structure is to be of steel construction and will have an abundance of show windows on both floors, costing about $50,000 and owned by A. Gerg.

Ore., Portland—Apartments — Construction of a 3-story apartment house to cost about $300,000 is ordered by A. S. Ellis. The new building will be located at the corner of Lownsdale and Taylor Streets and will contain 27 apartments, each having dumb-waiter service, electric ranges, hardwod floors, and the interior mill work will include mahogany paneled doors.

Ore., Portland—Lodge—A new temple is to be built for the Washington Masonic Building Ass'n on East 8th Street, and will occupy a plot 60 x 100 ft., two stories and basement. C. C. Rob-

bins is the architect. Estimated cost including furnishings is $65,000.

Ore., Portland—Offices — Rumors, which have been circulating for some time of a ten-story office building to occupy the 200 x 200-ft. block bounded by 5th, 6th, Taylor and Salmon Streets, have been confirmed. A board of directors has been elected and construction will start at once. The building will be a 10-story reinforced concrete fireproof structure. Two floors underground will be a parking place principally for use of tenants, accommodating approximately 500 machines. The ground floors will be used for retail stores and specialty shops divided by three arcades. The mezannine floor will be occupied by an auditorium containing two balconies with a large seating capacity. The six upper floors are to be devoted to offices. The building will have two 20-ft. escalators and six elevators. It is understood that the architects have been selected but their names have not yet been announced.

Ore., Salem—Apartments — Construction of a 72-apartment establishment to cost approximately $210,000 and to be located on the site of the old Thielsen home at Court and Capital Streets has been proposed by Warren Armingdon of Denver, Colo. An option has been secured on the property.

Ore., Portland—Residence—A permit for erecting a $46,000 residence on Portland Heights has been taken out by Quinn & Burton, contractors, 402 Railway Exchange Building. Max Hirsch, owner; Lawrence & Holford, Chamber of Commerce Building, architects.

Ore., Portland—Salesroom — Plans have been prepared by Strong & McNaughton, engineers in the Corbett Building, for an auto salesroom and repair shop to be erected at 13th and Burnside Streets, at a cost of $100,000. The building will be 125 x 110 ft., of heavy mill construction, owned by the Weinhard Estate.

Ore., Portland—Institution — A contract to build a $40,000 Odd Fellows Home for Girls was let to Wm. Friberg, Worcester Building. The new home will be located at 974 Holgate Ave. and will be three stories in height. John Hunzicher is the architect from Eugene.

Ore., Astoria — Hotel — The Columbia Hotel Company's building committee opened bids recently on the construction of Astoria's proposed new eight-story hotel and recommended the acceptance of bids as follows: General construction, Thomas Muir, Portland, $169,428, building to be completed in eight months; heating, Rushlight & Hastorf, Portland, $11,000; plumbing, Alaska Plumbing Company, Portland, $15,898; electric wiring, National Electric Company, Portland, $4,300.

Ore., Portland—Church—A church building to cost $50,000 has been planned by Lawrence & Holford, architects for St. Michael's and All Angels' Episcopal parish, and is to be erected at East 42nd St. and East Broadway. A parish house also is to be built on the premises.

Ore., Portland—The remodeling of the 12-story building recently purchased by Porter Brothers, railroad contractors, will cost approximately $100,000. Mr. Lackore, of Spokane, is to supervise the remodeling according to plans of the company. It is to be made into a first-class office building.

Ore., Portland—Hotel—Plans are being prepared by James Watt, architect, for a four-story store and hotel structure at the northwest corner of 12th and Alder Streets for J. J. Jennings. The building will cost about $75,000, and will be of brick with cast plaster and terra cotta trimmings.

Ore., Portland—School—Howell & Knighton, architects in the U. S. Bank Building, are preparing the plans for the Northeast High School. The building will cost approximately a quarter of a million dollars. Plans will be ready for figuring about the first of the year.

Ore., Portland—Lodge—Plans for the new Al Azar building, which will be erected by the United Artisans at the corner of Third and Columbia Streets, this city, have been completed. The building will be two stories in height, with two large assembly halls, a double stage and a banquet hall. The structure will occupy a space 100 x 100, and will cost in the neighborhood of $75,000.

Ore., Pendleton—School—The Waale-Shattuck Construction Company of Portland is to build the Griswold Union High School at Helix. The building will cost $60,000 and is to be completed in August, 1923. It will be red brick, trimmed with terra cotta and will contain in addition to the class rooms, a gymnasium and assembly hall.

Ore., Portland — Apartments — A new apartment house just completed costing $55,000 and of the latest type, has the high class equipment which includes electric ranges of the latest type in each of the eleven 4 and 5-room suites. The structure is located at the southeast corner of Vista Avenue and Laurel Street and is a three-story brick and concrete building. The design was compiled by Claussen & Claussen, architects.

Ore., Astoria—Hospital—The Fraternal Hospital Association structure is to be started soon on the corner of 16th and Exchange Streets and will cost about $150,000. Sven Lonberg is secretary of the association which is building this modern hospital.

Utah, Provo—City and County Bldg.—Contract for the completion of the new city and county building at Provo has been awarded to Rudine & Chytraus of Salt Lake City, at a lgure of $156,741.

Utah, Salt Lake City—Ry. Station—Contract for the entire building of the new joint terminal station of the Salt Lake & Utah Railroad and the Bamberger Electric Railroad, on the site of the present building, has been let to Jacobsen & Hodgson of Salt Lake City, for $163,000. Construction is to begin immediately. Young & Hansen, of Salt Lake City, are in charge of the architectural work. T. E. Thomas, of Ogden, was awarded the contract for plumbing and heating work, at $21,300. Contract for the electrical work was let to the Salt Lake Electric Supply Company for $9,494. The terms of the contract stipulate that the new building shall have been completed and be ready for occupancy within 150 working days. This means that the doors will be thrown open to the public in about eight months. The new structure will be two stories high, and will have a frontage on South Temple Street equal to that of the present building, plus the distance from the east side of the building to the corner of West Temple and South Temple Streets, with a considerable frontage on West Temple Street.

Wash., Spokane—Temple — Preliminary plans for the new Masonic Temple were approved recently by the trustees. Final plans were ordered prepared by Rigg & Vantyne, architects, who have estimated that the building will cost $300,000. The new location lies just east of the old temple. Work will be started in the spring.

Wash., Tacoma—Hotel—A site for the proposed new Tacoma community hotel to be built by the citizens of Tacoma at a cost of $1,000,000, has been selected by popular vote, and construction work will proceed immediately. Site is 215 x 133 ft.

Wash., Tacoma — Church — The First Presbyterian Church building committee announces that plans are proceeding for the proposed new $250,000 church structure to be built in the city, and that construction will start early next year. Site has been selected, and plans provide for a church with seating capacity of 1,200 to 1,500.

Wash., Seattle — Store — Preliminary sketches have been completed for a proposed 7-story steel and concrete retail store building to be built at Second Avenue and Union Street for the Arcade Building and Realty Company, owners of the site. The building will cost approximately $500,000 and will be 108 x 120 ft. in size. David Whitcomb is president of the company.

Wash., Seattle—Store—Jacobson & Mangrum, New York Building, have the contract for construction of a $25,000, two-story brick building to be erected by S. T. Toby.

Wash., Kelso—The Long-Bell Lumber Company, builders of the new town of Longview near Kelso, will proceed immediately with the construction of a 250-room hotel, and 250 four and five-room cottages, in addition to five large dormitories. R. A. Long, chairman of the board of directors, has arrived in the city and is directing operations.

Wash., Seattle — Home — Architect John Graham has completed plans for the $1,000,000 Home for the Aged to be erected by the St. Vincent Order in Seattle. The structure will be built in units, the main building to be five stories high, of reinforced concrete construction, 276 x 294 ft. in size. Bids will be called at once.

Wash., Longview — Stores and Offices — The Long-Bell Lumber Company plans immediate erection of a store and office building to cost $80,000 in this city. The structure will be 120 x 150 ft., three stories high, of mill construction. Longview is the new town being constructed by the lumber company and which, it is believed, will have a population of 30,000 within a short time.

Wash., Spokane—Lodge—Knights of Columbus order plans the erection of a $250,000 lodge building on a site to be selected at once. Plans provide for auditorium, ball room, lodge rooms, gymnasium, swimming pool.

Wash., Seattle—Store—E. F. Sweeney Investment Company plans the construction of a three-story and basement, 130 x 108 ft., brick and terra cotta, sales and service station for the Ford Agency. The structure will cost $85,000 and will be occupied by the William McKay Company.

Wash., Seattle—Apartment — J. H. Williams, here, plans the immediate erection of a 10-story apartment building, of reinforced concrete construction, to cost $250,000 and to be 60 x 120 ft. in size. The structure will contain 100 apartments of two and three rooms each. Electric elevators will be installed, and each apartment equipped with an electric range.

Wash., Seattle—Store—Mrs. William B. Bebb plans the construction of a two-story store and loft building to cost $85,000. Architect and Engineer Henry Bittman prepared plans, and Parker & Wood, Arcade Building, have the general contract.

Wash., Seattle — Hotel — J. Otis Post of the firm of George B. Post & Sons of New York City, selected as architects for Seattle's new community hotel, is in the city preparing tentative drawings for consideration of the board of directors. Associate architects in Seattle are Bebb & Gould. The structure will contain 650 rooms, with foundation for additions permitting of 900 rooms, and will cost $2,800,000. The hotel will be operated under lease by the United Hotels Company and Roy A. Carruthers of New York City. Financing has been completed by sale of bonds to Seattle citizens.

Wash., Walla Walla—College—Final plans for the Whitman College men's dormitory have been completed by Architect A. Lawrence of Portland and call for bids will be issued immediately. Building is to be completed by Septtember, 1923.

Wash., Seattle — Store — Architect Harlan Thomas, Arcade Building, has completed preliminary sketches for a proposed seven-story steel and concrete retail store building to be built on Second Avenue and Union Street at a cost of $500,000. Structure will be 108 x 120 ft., and will be built by Arcade Building & Realty Company.